

# RADIO

REG.  
U. S. PAT.  
OFF.

THE NATIONAL TRADE MAGAZINE  
JANUARY, 1933

They Have Copied Everything—

Except CERTIFIED TRIAD Quality

IT IS WRITTEN—

*"Imitation is the sincerest form of flattery"*

**TRIAD**

Appreciates the compliment it receives each month from other tube manufacturers who have copied our sales plan—our method of advertising—our discount schedules

**TRIAD**

Was first to recognize the Service Man

**TRIAD**

Was first to make double-tested tubes

**TRIAD**

Was first to offer a plan which really makes money for the dealer and Service Man

**OTHERS** have made every effort to do the same thing

**BUT**

**THEY HAVE NOT BEEN ABLE TO DUPLICATE**

**CERTIFIED**

**TRIAD → Quality**

**TUBES**

CERTIFIED Triad Dealers and Service Men everywhere have sold many thousands of these tubes—they are making money—there hasn't been a single complaint. Mail the coupon today and learn how you can sell these super-grade tubes at a real profit. We protect you in your territory and you are sure of all of the inducements offered by other manufacturers, plus quality which is in a class by itself. GET THE FACTS!

**TRIAD** Manufacturing Co.  
Pawtucket, R. I.

Gentlemen:

Please send me the outline of the CERTIFIED TRIAD Sales Plan for Dealers and Service Men.

Name \_\_\_\_\_

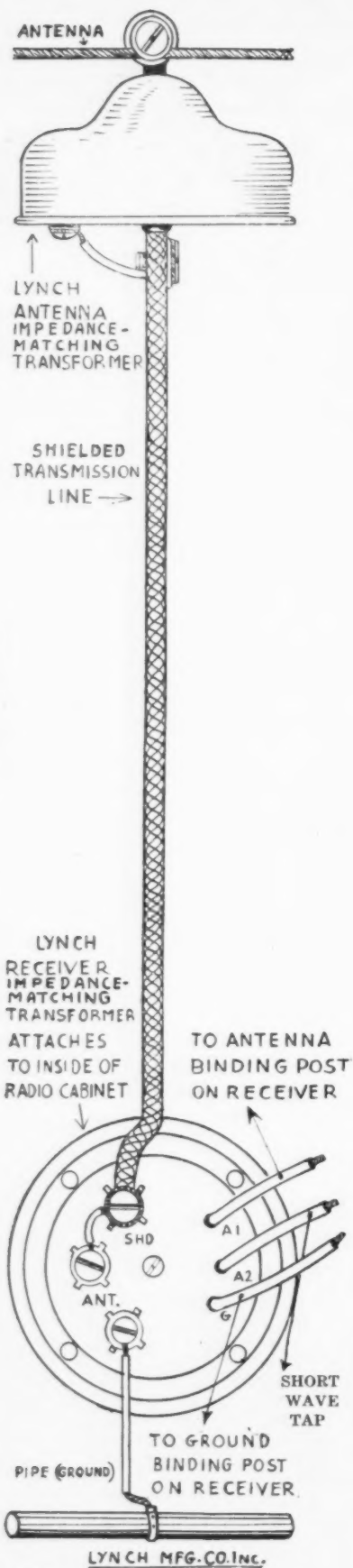
Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

My letterhead or business card is attached

# LYNCH Antenna Systems ("NO-STAT")

(LICENSED UNDER A. A. K. PATENTS)



**MORE PROFIT  
LOWER PRICE  
EASIER TO INSTALL  
EASIER TO SELL  
BETTER RESULTS**

No radio receiver is modern without a noise-reducing antenna system.

Our system not only eliminates "man-made" static but also permits the use of several receivers on a single antenna without the slightest interaction.

Our system includes the "short wave" feature not found with others.

Our system includes a feature which makes it useful with old as well as new receivers.

## LYNCH "NO-STAT" Shielded Antenna Kit

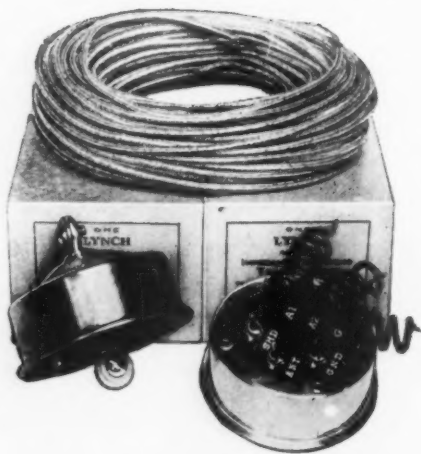
**\$5.00**  
LIST  
COMPLETE

### DEALERS . . . SERVICEMEN

If your jobber cannot supply, write his name and address on your letterhead and attach this ad with check for \$3.00. Kit will be sent prepaid and sale credited to your jobber.

...

*Interesting literature describing many other Lynch products sent on request.*



© 1932

**LYNCH MANUFACTURING COMPANY, Inc.**  
711-R GENERAL MOTORS BUILDING  
NEW YORK, N. Y.

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# REMLER

## Plain Talk About Radio Sales Profits

In these days of low priced merchandise it is more than ever necessary that the dealer's margin should be sufficiently high to enable him to make a reasonable profit on every individual sale.

Remler radios are priced so that the dealer's profit is adequately assured. Not only is profit assured but performance is such that it will out-demonstrate and out-sell other moderately priced radio sets.

### NEW 5 TUBE REMLER MINUETTE

The latest addition to the Remler line is the new five tube Minuette with superheterodyne circuit, new type tubes and continuous tone control permitting full tonal value at any volume. Speaker larger than ordinarily found in radios of this size. Attractive cabinet. Long and short wave. List price is the same as for the former four tube model—\$29.90

Other models include the six tube superheterodyne. Circuit has been engineered to take advantage of the new type tubes. Incomparably fine tone—distance—sharp tuning and sturdy construction throughout. Short wave optional.

The nine tube superheterodyne table model is distinguished by its exquisite cabinetry, its superb symphonic tone quality, and its transcontinental range. Other features include noise suppressor and automatic volume control.

**REMLER COMPANY, LTD.**

2101 Bryant Street

San Francisco, Calif.

#### 1933 Remler Models List Prices

Model 21-3 . . . \$29.90  
(Illustrated)

With Short Wave

Model 10-3 . . . \$39.75

With Short Wave . \$42.75

Model 15-3 . . . \$59.50

With Short Wave



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R E M L E R . . THE RADIO FIRM AS OLD AS RADIO

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# "RADIO"

The National Trade Magazine

FOR JANUARY, 1933

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Editor—K. N. FORD

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## FORECAST FOR FEBRUARY "RADIO"

**A**WAITING the reaction from readers, anent the new Short Wave department which has been added to this issue, additional material of this nature is "hanging on the hook", ready to print next month if sufficient interest is aroused. A letter or a postal card from you will help determine the value of this kind of information.

It was believed, some weeks ago, that an important television announcement would be forthcoming in January but the Sphinx has remained mum. It is learned that cartons for packing cathode ray television tubes are already printed and that a large quantity of these tubes have been produced. Nobody seems to know why cathode ray television is not being released for experimental purposes on short waves.

A Los Angeles station announced a nightly cathode ray television schedule early in January and it's on the air now. But who is going to see the pictures? There isn't a satisfactory piece of television apparatus on the market . . . not even for the experimenter. Yet, the "Secret Six" says it's perfected . . . ready to go. WHEN?



## The Editor's Mail

Your Contributions Are Invited

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### The Japanese Lamp Problem

The Editor, "RADIO",

Dear Sir:

Do you know that 80 million Japanese light bulbs were imported into the United States? That the average life of these lamps, under actual test, is but 70 hours? That American-made lamps have an average life of 1000 hours?

These are facts. Let us face them. The "Buy American" campaign is already cutting deeply into this Japanese lamp invasion. One large jobber has been sued for selling them. It appears that the G.E. holds certain patents on lamps which are infringed by the Japanese manufacturers.

I have just had a call from a friend of mine who is in the employ of one of the local utilities. Until recently he was employed on a full 8-hour day basis, 5 days a week, 1,600 employees were laid off. Many of them were asked to push doorbells and join in the city-wide drive to sell Mazda lamps. The utilities are in the lamp business in a big way, as you know. They sell lamps at list prices and give 10% discount if carton-lots are purchased. This fellow sold enough lamps in one day to net him a commission of \$4.50. That, of course, was his best day. His salary is \$70.00 per month from his part-time employment with the utility people because he works but ten days each month and receives \$7.00 for his daily pay. He has been gathering statistics on this Japanese Lamp Invasion problem. A bill has recently been passed by Congress, I understand, making it unlawful to import the Japanese lamps. But what is going to stop the Japs from importing these lamps into Mexico and then bootleg them in the U. S.?

Nineteen thousand complaints are on file in the offices of the Pacific Gas & Electric Company, all from consumers who have complained because of "overcharges" in electric current consumption. Upon investigation it was found that more than 90% of these complaints originate from people who use Japanese lamps. The Japanese 60 watt lamp will consume from 60 to 100 watts, others have been found to consume 120 watts, or a 100% greater consumption than the American-made lamps. It is quite evident that with the use of these Japanese lamps the consumer is paying, in some cases, 100% more for his electric current than he would pay if American-made lamps are used. These Japanese lamps are sold in some stores, over the bargain counter, for as little as 3c each. The average retail price is 10c. The equivalent lamp of American manufacture costs 20c. Little does the consumer know when he purchases these

Japanese lamps that the average life is but 70 hours, that they cost more to burn, that it will cost him far more, in the long run, for current consumption and for replacements than if American-made lamps were bought in the first place.

You can always identify a Japanese lamp because it carries a "Made in Japan" stamp on the base.

It is required by law that Japanese-made goods carry this stamp. Radio dealers who sell American-made lamps now have a lot of good ammunition to combat the sale of Japanese-made lamps. The public will soon tire of a lot of the cheap merchandise which is now on the market, once they are told the facts. It's the same old story—"What you get for nothing, amounts to nothing".

Yours very truly,

C. W. Senn.

### More Loyalty

Editor of "RADIO",

Sir:

I believe the "Buy American" campaign is a mighty good thing but it has its limitations. Just yesterday a salesman came into our store and asked us to buy some placards with the "Buy American" slogan. In our neighborhood there live many people of foreign birth. Quite a few of these people are my customers. I know that were I to display the "Buy American" sign these people would no longer trade with me. I speak from experience because a small general merchandise store across the street from my place of business had one of the placards on display and I have heard an endless amount of criticism from foreign born people, some of them stating that they will no longer purchase goods from that store.

I have nothing in my store that, to my knowledge, is not made in the U. S. A. All of the sets I sell and the few accessories and odds and ends, all appear to be made in our country. So I do not feel inclined to display the "Buy American" placard, even though I am heartily in accord with the plan. Some people have already questioned me as to the make of merchandise that I sell. I merely tell them that practically everything that goes into a radio set is made here and, to my knowledge, there is not an imported part in any of the sets in our store. But the butcher, baker and candlestick maker who cater to every nationality are going to send much business to other stores if they don't watch their steps. I think the campaign can be made more effective if the dealers refuse to buy other than American manufactured goods. Then they will not have any foreign goods to sell the consumer. (Signed) E. C. Lessing.

### Subscription Order For "RADIO"

Publishers of "RADIO"—Pacific Bldg., San Francisco, Calif.

Here is \$..... for subscriptions to "RADIO" for one year each  
(at \$3.00 per year) to be sent to the following:

Name ..... Address .....

Name ..... Address .....

Your name..... Your address.....

# AT LAST!—

## A Modern Tube-Checker At a Price You Can Afford

### MODEL E33 TUBE-TESTER Tests All 4-5-6 and 7 Prong Tubes

#### Simple to Operate— Light and Portable



Tests the new 56-57-58, the 41-42-43-44, the Majestic Duo-Diode, the Speed 295, the Wunderlich 5 and 6 prong, 55, 85 and 89, the ER49, the TS57 as well as numerous other types, including Sparton and Kellogg new and old models; the new 7 prong tube and the Philco 15-volt tube. The actual testing is easily made as a chart is provided that shows the position in which the Selector switch should be set, the socket in which the tube should be inserted, the switches to press and the readings for the tube under test.

The following tests can be made:

- (1) SHORT TEST
- (2) GRID CHANGE TEST
- (3) OSCILLATION TEST
- (4) TOTAL FILAMENT EMISSION TEST

Tubes can also be PRE-HEATED in tester while testing is under way as the transformer is sufficiently oversize to take care of the load without affecting the readings.

**VOLTAGE ADJUSTMENT**—Voltage adjustment is provided that will take care of a line variation of 90 to 130 volts. This allows uniform readings for comparison with chart.

**SHORT TEST**—Insert tube in socket in which it is to be tested and press one switch. If "short" exists PILOT on panel will light up. Eighteen possible "short" combinations are tested.

**GRID TEST**—The grid change test shifts from high to low readings when proper switch is down. This test is similar to the one provided on the usual type tube checker.

**OSCILLATION TEST**—The oscillation test is of special importance as it will sometimes show up a bad tube not otherwise indicated and allows tubes to be matched for SUPER use. The great number of super sets in use necessitates some means for matching tubes and the circuit in the E-33 is designed for this purpose as it gives a large swing on the pointer, when oscillating, thus allowing accurate matching. The oscillator can also be used for lining up condensers, or for any use for which an oscillator of this type would be desirable.

**FILAMENT EMISSION TEST**—The total filament emission test is of value, when used in conjunction with other tests on certain low reading tubes, such as -99, 200A, etc. Full instructions covering this test in instruction sheet.

BOTH PLATES of the 280-282-283 can be tested.

THE 9 SOCKETS AND THE SELECTOR SWITCH offer a range and flexibility that covers any tube combination including the 7-prong type. This instrument will not be OBSOLETE a few months after purchasing.

This instrument has bakelite panel and is mounted in veneer wood case covered with imitation leather. Top and handle is provided. Not shown in cut. Top removable when open.

The material is equal to that used in any tester, regardless of price.

NET PRICE TO DEALERS AND SERVICE MEN - - - - - \$19.80  
(Shipping Weight 8 lbs.)

*Order Direct or Write for Trial Offer*

## L. & L. ELECTRIC CO.

336 MADISON AVENUE

MEMPHIS, TENNESSEE

# Completely A-C Operated Modulated Test Oscillator

# \$6.93

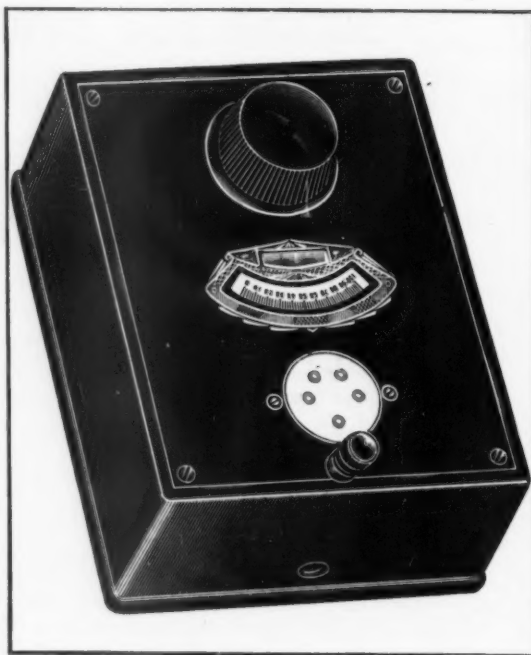
## Lines Up All Intermediate Channels

**H**ERE is just what the trade in general and the service man in particular have been looking for—a modulated test oscillator that affords all the accuracy that is required, and that can be obtained at a price. And the low price is not a denial of accuracy, either, for this instrument is guaranteed to be accurate to plus or minus 2 per cent, and therefore is of greater accuracy than that to which most dials can be read.

This oscillator has a frequency-calibrated dial, a specially made scale that affords true registry, a feat accomplished only by considerable care in the manufacture of each one, requiring adjustment of both the inductance and the capacity. The conformity is excellent, and besides, one gets rid of the nuisance of consulting a chart. The frequencies are imprinted right there—the fundamental range of 50 to 150 kc. So some intermediate frequencies are read directly as fundamentals, others as harmonics, and for each intermediate frequency requiring a harmonic for testing you will find the intermediate frequency imprinted on the scale, too, just above the fundamental scale. And what intermediate frequencies are covered? Why, all that are used commercially today: 115, 130, 172.5, 175, 177.5, 260, 400 and 450 kc.

## Tenth Harmonic Covers Broadcasts

**S**INCE the fundamental frequencies of this constantly-modulated test oscillator are 50 to 150 kc., therefore the broadcast band of frequencies—and then some—may be read directly from the dial by using the tenth harmonics of the fundamentals. So just annex a cipher mentally and you have 500 to 1500 kc.



The modulated test oscillator is completely self-contained and self-operated (except that the required 56 tube is not included), and has a dial with frequencies imprinted, instead of a mere numerical scale. The oscillator is constructed under the supervision of the highest type engineers, graduates of the Massachusetts Institute of Technology. It has complete power supply for heater and plate voltage built in, and uses the a-c hum for modulation. A clear, distinctive note is modulated, and zero beat can be established readily with carriers.

## Cash In On This Opportunity!

**T**HESE modulated test oscillators are now being offered for the first time, and they afford a real opportunity to stores that handle radio, to cash in on sales they are now missing. A great many persons not directly connected with the trade need such oscillators for their experimental work, and a considerable sale can be developed, because the product is right and the price is right.

No service man should be without a modulated test oscillator, and while every service man will agree to this fact, some may have said rightly that they could not afford to put up the money for a "regular" oscillator, and wouldn't find an "irregular" one useful. But how about a regular oscillator at a price you never before thought possible—\$6.93, all complete, in a sturdy carton (less tube)? Well, that's different, isn't it? So come on—join the many who are finding this test oscillator their reliable way out of a difficulty.

**DIRECT RADIO CO., 145-P West 45 St., New York**

# Radiotorial Comment

— BY THE EDITOR —

CONSIDERABLE space in this issue is devoted to the subject of special antenna construction for short wave receivers. This is a subject that should be of vital importance to every radio merchant. Much energy is devoted by the salesman in selling a radio set, not enough by the dealer or his service man in providing the customer with the proper antenna. The many refinements in present-day receivers can be more adequately utilized if the receiver is connected to the proper antenna system. Almost a year ago there appeared in these columns a feature article by Mr. Don C. Wallace in which he told how to design a proper antenna for short wave reception. So many requests have been received for back copies of this issue, and the article has been so widely reprinted in other publications, that it was deemed advisable to publish a more complete description and explanation of the how and why of antenna systems.

□ □ □

WHEN you sell a set you may as well sell the customer a GOOD antenna. Antenna installations are an added source of revenue from many of your present customers whose roof-tops look like the "Wreck of the 'Hesperus'" because of the hay-wire aerials that are strung from one end of the roof to the other. If you have a good receiver on demonstration in your salesrooms, isn't it reasonable to assume that you, too, should have the proper antenna installation on the roof of your store so that can make better demonstrations? The elimination of noises, man-made-static, A.C. hum and other kinds of interference calls for the use of a 1933 type of antenna, which is so different from that of yesteryear that the two offer no basis for comparison.

□ □ □

SUCH data as is contained in this issue's article on antenna construction may seem complicated to you. But there is really nothing complicated about it. If you don't

understand some of the details, your service man will know what the author is talking about.

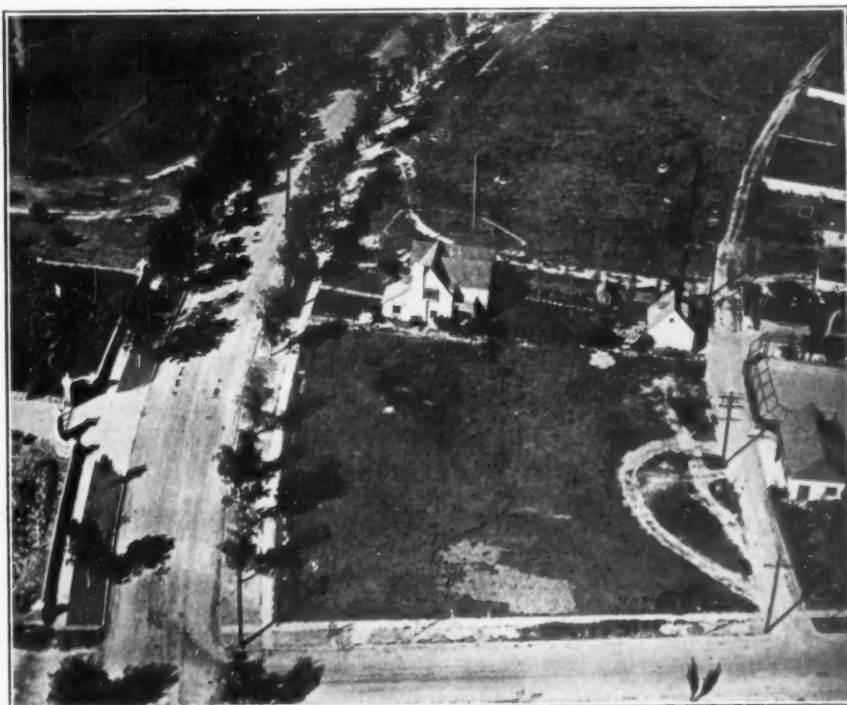
When business is quiet the time is ripe for a concerted effort on your part to sell something new to your customers. Many a person will not trade in his, or her, present receiver. A lot of people will listen to a sensible sales discussion on the merits of a better antenna installation.

The antennae described in this issue are designed for short wave reception. It is a known fact that a properly designed short wave antenna is always more suitable for broadcast reception on standard frequencies than any of the garden variety antennae that average Mr. and Mrs. Public uses. Another reason for the publication of this extensive treatise on antennae is to help you in the solution of the ever-baffling problem of getting better results from short wave receivers. The many dealers who sell short wave equipment will find this article of more than timely value. Much of the information has not heretofore been in print. It was given to us by Mr. Don C. Wallace, factory representative for a number of our best-known radio manufacturers. Wallace is also an authority on amateur and short wave equipment design. Because of his excellent short wave communication he was awarded the Herbert Hoover Radio Cup.

Any short wave receiver will pick up more stations, more distance, if a correctly designed short wave antenna is used. You can give better demonstrations in your store if you give the receiver a chance by connecting it to a properly designed antenna.

Larger and better aerials will find a wide market in rural localities. Those who live in remote places are always interested in hearing MORE stations . . . due, in part, to the added hours of home leisure which are enjoyed by those who live "in the sticks." Many short wave sets that are not giving proper performance in out-of-the-way places can be improved considerably by the use of one of the antennae described elsewhere in these pages.

ILLUSTRATED is the "Proving Grounds" of Mr. Don C. Wallace, of Long Beach. With 25 acres of ground space at his disposal, and after erecting more than 700 kinds of antennae, Wallace has developed the perfected antenna for short wave reception. He has also found that the elimination of a ground is all-important for better short wave reception. Many miles of ground wire, underground conduit systems and counterpoises were used in deriving at the findings. The accompanying airplane photograph of the Wallace estate was snapped by a fellow radio experimenter, Mr. Howard Diechen, Minnesota pilot, who "dropped-in" on Wallace for a friendly visit.





Dr. Ralph L. Power

# What's the Matter With the Midget Set Manufacturers?

Present Status of Affairs in the Capital of Small Radio Receiver Producers Critically Analyzed, Dissected and Commented Upon For 1933

By DR. RALPH L. POWER

"DOC" POWER, writer of this article, has just completed ten years as a Los Angeles newspaper radio editor. Previous to this, he had been professor of business administration in the University of Southern California.

In recent years he has been connected with a dozen or more Los Angeles radio factories from time to time in consulting capacities.

His infrequent articles therefore have the stamp of being authentic and practical and are widely read.

## What it costs to make a four-tube midget

Parts .....	\$7.54
Labor .....	1.00
Overhead .....	1.00
Commission .....	.50
Tax .....	.52
Profit .....	.29
Price to Wholesaler.....	10.85

Read further details in this article.

**T**WELVE months ago the New Year story from Los Angeles was in the form of a time-honored symposium wherein each and every radio manufacturer voiced his sentiments for the forthcoming year.

But this year I am taking the bull by the horns . . . or wherever it is that one grasps on the gentleman cow . . . and am going to give you an inside peek at this capital of midget set-makers.

I daresay that perhaps many of the ills so prevalent among radio manufacturers of the southwest may also be found elsewhere. But my cross-country trek of a few months ago did not give me a first-hand sight of them, and so I am going to confine this diagnosis to Los Angeles.

There must be something radically wrong when radio set-makers close their doors . . . or get thrown bodily out . . . while bakeries, sports shops, peanut vendors and others

move into their place of business and make a good living.

Obviously all is not well when radio manufacturers take on side lines of making motor boats, slot machines, marble games, airplane gliders and what not.

If you are a busy member of the trade, and can't be bothered in reading a long article, I can tell you in a nutshell what is the matter with these fellows in Southern California.

In the first place, too many of them came into this phase of manufacturing merely because they saw some ready money on the then rosy horizon.

Then, in the next half dozen places, this logically meant that the majority were inadequately financed, had no fundamental idea of distribution, even an inadequate technical knowledge, no idea of ethical practices, only a hazy notion about sales promotion, and a decided tendency to mind the other fellow's business to the point where it became almost an obsession to tell the other fellow what to do.

492822  
V. M. H. 35

## Start On Shoe String

THAT is the gist of the story. But if you would like further details, read on.

Let's take a little look into the finances of the thing. Maybe you'll wonder if any of them have been adequately financed since so many firms have gone out of business, or are now in the process of equity receivership or bankruptcy.

Perhaps you will think it's a bit queer that one firm, doing a cash business, can go on the rocks for more than \$100,000 and another slips over the rocks for about half that sum.

I don't know the answer to these. But I do know that by far and wide the greatest mortality in the radio manufacturing business around here lies in the fact that the people try to do business on a shoe-string basis.

They may conceivably get by when their production is not over a dozen sets a day. But the minute they get a score or more sets on the line every day they are in hot water with their creditors, banks, trade acceptances and what have you.

Too many of them lead a hand to mouth existence. I know of one who rushes out and gets parts whenever he gets an order for a few sets. He doesn't keep any stock on the shelves for two reasons . . . (a) he has no funds or credit to buy parts and (b) creditors might swoop down and clean him out.

The past year he has literally covered the burg with rubber checks of ten and fifteen dollar denominations. But none of the firms have made trouble merely because the amounts were small and not worth the trouble of legal recourse.

## What It Costs

IT takes a lot of cold hard cash to really finance radio set-makers, whether they be large or small outfits, whether they sell out here on the coast or extend operations east of the Mississippi, whether they produce a standard outfit or an all-wave receiver.

No set manufacturer can hope to make a success out of his business unless, and until, he has enough financial backing to care for, over a period of months, the various items that go to make up the accounting forms.

He must make provision for factory and office help; fire, theft, liability and other insurance forms; parts; shipping; shrinkage, interest on investment, overhead and a dozen other items of this type.

Let's look at the cost sheet of a reputable firm that puts out a good 4-tube midget set. Their monthly production is based on 400 sets which allows \$1 a set for overhead . . . rent, electricity, postage, and other items.

Here it is:

Parts .....	\$7.54
Labor .....	1.00
Overhead .....	1.00
Commission .....	.50
Tax .....	.52
Profit .....	.29

Price to wholesaler.....\$10.85

There are not many small set-makers around here who know what their actual costs are. I venture to say that not one in ten makes provision in his calculations for interest on his investment.

Few figure on shrinkage and breakage, though the above concern reckons this at  $\frac{1}{2}$  of 1%.

Perhaps this dollar for labor may look high to you. Some of the firms will tell you that it only amounts to 36 cents on the bench. But they do not include bookkeeping and office salaries, pick-up and other costs that logically belong to this labor cost per set.

This above firm allows 50 cents commission. According to the present set-up this figure is fair. Yet there are some firms that only give 15 cents commission, and the salesman has to deliver sets and pick up the money.

Not all the factories agree on the federal tax which apparently is 5% on the lowest wholesale price.

So there you have some financial angles that are not generally known. Most firms do not actually know their costs. Here is one firm that knows its costs and yet its net profit is only 29 cents a set on a good 4-tube midget receiver.

## Sales Promotion

AND now for the sales promotion angle. These small-set fellows are opportunists. They spend a nickel. If it doesn't bounce right back, and drag another five-cent piece with it, they are through with advertising.

The average local radio manufacturer will get out a thousand leaflets as correspondence inserts, half that number of blotters or novelty pieces, takes one trade magazine advertisement and a few other ideas on a similar scale.

If results don't show up inside of a week they forever blast sales promotion activities.

On the other hand, a few have realized the value of organized and consecutive advertising.

I know of a manufacturer who has developed one export customer to the tune of 150 sets a month. The foreign merchant saw his ad month after month and figured he was in business to stay.

Then there is another manufacturer whom I could name. He paid his overhead month after month on the profit of new accounts from the middle west. And the repeat orders made him a good sized profit.

Both of these factories, by the way, took their first advertising with RADIO and credit their start to this magazine.

But so long as Los Angeles is crowded with single-shot factory heads I don't think that many far sighted individuals will develop from their midst.

## Arbitration Attempts

WHY can't these midget set-makers clean house among themselves? That's a fair question.

There has never been a fair margin of profit in these midget sets. Around Christmas time they were retailing in Los Angeles as low as \$5.95 for a three-tube set.

As a matter of fact a midget that costs less than ten dollars to produce ought to retail at from \$24.50 to \$29.95 if everyone along the line is to get enough profit to pay for his trouble . . . to pay for his overhead, operating expenses and promotion.

For years the Radio-Music Trades Association of Southern California has played with the topic of higher prices, wider margin of profit, unfair competition and other subjects.

On January 3 their newly formed arbitration committee met and, as I understand it, set a wholesale price on 4-tube midgets at \$9.95 without tone control and \$10.45 with tone control.

Yet, as this is being written on January 6, I have before me a large sized ad in the daily papers. It is from a leading department store and advertises 4-tube licensed sets at \$9.95 retail.

Perhaps these set-makers can police their own territory. Time will tell. But it's a pretty large-sized order.

## License Fees

**A**ND so we come to the question of license. At one time there were nearly 60 unlicensed radio manufacturers in Southern California. Just now that number has dwindled to about 15 of any size and some six backyard shops.

I hold no brief for "trust" interests, but venture to say that the "handwriting on the wall" indicates that sets cannot be produced without RCA, Hazeltine or Latour patents. They can be made, of course, but cannot be sold without patent infringement.

This will be more evident as time goes on, unless some revolutionary idea can be developed which will get around the patent clauses.

The so-called trust can force the issue whenever they want to. In practice they seldom bother until the set-maker gets into big figures in production.

Of course when certain patents expire the picture may reverse itself but that, of course, is a story in itself.

I suspect that practically all of the local manufacturers would "go license" if they could get a "new deal." But, whether they do or not, the licensed set will continue to receive the bulk of the business with the unlicensed makers plodding along diligently in the rear.

On a 4-tube set the license fees roughly range between 20 cents and 30 cents . . . being 5% of the costs, but not including cabinet, speakers or tubes.

To this the licensee adds between 45 cents and 60 cents for "extras." This amount apparently includes the affixing of a one-cent sticker to the set, and handling the payroll of the sub-licensee for which, however, the sub-licensee is bonded beforehand.

This seems to be the bone of contention among those who are licensed and those who are not. Most of them tell me they do not seriously object to the license fee but they do take exception to the "extra charge" angle.

## Making Cheap Sets

**B**UT let's get along to the ethics angle. Maybe this is treading on dangerous ground.

Yet it isn't good ethics, or sound business, to chisel too much. Some of the firms are using Japanese light bulbs to save 2 cents a set. But they don't last as long as American-made bulbs.

A few use rubber knobs, instead of bakelite, but the kick-back from customers has been enormous. Several put out their sets without tone control and thereby save themselves about 22 cents. A few put on a high-low switch at the cost of 14 cents and try to substitute this as a tone control. Of course it is only a subterfuge.

Some of the sets come from the line minus escutcheon plates and another 9 cents is saved. The old "Caveat Empor" phrase seems to hold good in this capital of midget makers.

Cheap resistors gives another chance to economize at the expense of the set. Speaker trouble is another common chisel point. Leads are often not soldered and the voice coils go haywire.

But none of these short cuts make much difference in final costs of the set, although it does make for a receiver that is plenty cheap in performance, operation and maintenance.

Then there's the case of one or more manufacturers who use low-grade condensers. Before long they come back for repairs.

The filter condenser costs about 28 cents each and perhaps 15 minutes work. But the cost to the customer is \$3 for one filter replacement or \$4 for the pair.

Of course in this case it is the retailer or service man who profits but, just the same, the manufacturer is the one who is violating the code of ethics.

While we're speaking of ethics, there's the case of an employee of a factory some time ago. He used to send out parts and sets to himself under another name.

He formed a company and sold the sets that he was getting from his employer. Just now he's still in the big house.

If you're not bored by the "ethics" discussion, take the case of a local manufacturer who induced a manufacturers agent to change his distribution system for sockets.

He advised the agent to stop making small deliveries to little outfits, eliminate any credit arrangements, give up keeping a factory stock on hand. In other words, the agent would handle all supplies direct from the eastern factory.

But when the system finally got into working order, the manufacturer who started the ball rolling showed his appreciation by pulling out and ordering his sockets from another local agent who kept a factory stock, gave credit and made deliveries. And before long this first agent had lost all of his socket customers to competitors.

## Unsound Distribution

**T**HERE has never been a clean cut plan of distribution for the makers of midget sets out here on the coast. Some of the manufacturers are their own jobbers. Some absorb all the functions from the manufacturer to wholesaler and retailer. Some sell to good accounts, and then enter into competition with them by opening up their own retail outlets in the same town.

And yet I don't know that this is to be wondered at for many of the present factory heads came into the radio field without sound business knowledge.

They used to run garages, pool halls and grocery stores . . . Some were practical wireless men, ship's operators or amateurs. But the point I want to make is that they did not make a success of the ventures with which they were associated before they entered the realm of radio.

Radio manufacturers cannot make the industry profitable and permanent until the unfit are weeded out. Those left must have sound financial backing, logical distribution, good business methods, practical engineering knowledge and adequate sales promotion effort.

Somebody asks me if midget sets is synonymous with cheap sets. No, not always. I have known some mantle sets that outplayed and outlasted consoles from huge eastern factories. On the other hand, I have known midgets that wouldn't stay together long enough to move them across the street. It all depends on the manufacturer.

In the meantime, I suppose that things will continue without much radical change. But it behooves eastern accounts to investigate carefully before they begin to do business with radio factories in the southwest.

There are many factories with honest men, skilled workmanship and standard production. But there are also gyps, fly-by-nights and unscrupulous individuals in the flock.

**W**ITH 50 radio manufacturers to choose from in and around Los Angeles . . . licensed and unlicensed, real factories and garage workshops, legitimate business and fly-by-nights . . . it behooves wholesalers and retailers to carefully investigate in selecting a manufacturer from the Southwest.

# Ramblings

Things That Are Happening... Here... There... And Everywhere



## "Remote Control" To Be Feature of 1933 Philco Model Radios

FOR some time there have been rumors that Philco was about to bring out some form of remote control set among its 1933 models, but it was not until this week that any confirmation of this story could be made.

Now from the Philadelphia headquarters of Philco we learn that this manufacturer is definitely embarking on the production of a new form of remote control set—which will be known as the Lazy-X models. The name was selected because these new models combine the feature of the Lazyboy and X models which are already well known Philco products.

In the Lazy-X, Philco engineers have designed an electrical remote control system that is not limited to a few stations as in the case of mechanical remote control, but which gives the listener command of the entire broadcast band. He can not only tune in any available station from his easy chair, but he can increase or decrease volume and utilize the Philco four-point tone control without stirring more than his hand.

The Lazy-X models will undoubtedly attract wide attention as there are two separate units in each set. The controls are contained in a compact, attractive cabinet of hand-rubbed, butt and pin stripe walnut of Queen Anne design which serves in a dual capacity—providing a handy and most decorative end table. The sound cabinet which is of the patented Philco inclined sounding board type may be placed in the most convenient and acoustically effective position anywhere in the room. All the controls are in the control cabinet and the only connection necessary between the two units of the set is made through a flat tape. In order to eliminate all excess wiring from the room, Philco provides an electrical outlet in the control cabinet for attaching a floor or table lamp.

The Lazy-X is to be made in two models, one of slightly greater power and distance range than the other. For radios of the remote control type the larger model to be retailed at \$150 while the smaller model probably sets an all time low price mark for a remote control radio at its retail price of \$100.

A complete technical description of the chassis is not available at this time.

Many people recovering from illness, or unable to move about freely, have found hours of pleasure and relaxation listening to the radio. However, there has always been one thing in the past that was difficult to regulate—the distance between the radio and the listener. If the radio was close enough for easy operation, it frequently became too loud to be thoroughly enjoyable to a person needing rest and quiet. If it were placed far enough away to overcome this condition, it could not be controlled by the patient, and aid must be summoned to change from one station to another.

## Boy In Cellar 3 Years Proves Genius

The strange case of a 22-year-old youth, rescued from a "voluntary imprisonment" for three years in the cellar of his Cincinnati home, was investigated by authorities.

Though suffering from exposure, and his hair matted and prematurely graying, the youth, Arthur Doebrich, Jr., astonished doctors with evidences of seemingly unusual mentality.

He had been working on a television set, he said, had built numerous radio sets, with money given him by relatives. (A.P.)

While there have been some forms of mechanical remote control on the market they were usually beyond the means of the average household and also were limited in their selection of stations. Now Philco has perfected electrical remote control which places all available broadcasting stations at the command of the listener, and at the same time enables him to control both the volume and the tone of the incoming broadcast from bed, wheelchair or ordinary easy chair.

All the controls of this Philco Lazy-X radio are in a Queen Anne table cabinet which can be placed wherever it is most convenient to the listener. Even when the radio is in use there is ample room on the flat top of this cabinet for a small tray to hold medicine bottle or drinking water, and as an additional convenience there is provided an electric outlet for a floor or table lamp so that there need be no extra wiring to place a reading light beside the radio controls.

## Bosch Radio Poll Draws 25 Million Votes

THE United American Bosch Radio Star Popularity Poll came to a spectacular climax on January 3rd. Arthur D. Murray, President of the United American Bosch Corporation, delivered a short address before the microphone, outlining for radio listeners the objectives and scope of the Poll.

The eight cup winners were:

Rudy Vallee, most popular orchestra leader; Morton Downey, most popular man singer; Jessica Dragonette, most popular woman singer; John S. Young, most popular announcer; Ed Wynn, most popular comedian, who was not present because of broadcast engagements in Chicago, but who was represented by Earl Benham, close personal friend; Richard Gordon (Sherlock Holmes), most

popular dramatic actor; David Rubinoff, most popular in instrumentalist class; and Harry Horlick, director of the most popular programs in the miscellaneous class (A & P Gypsies).

Interesting highlights of the balloting are that better than 3,100 radio stars were voted on by the public. The ballots were presented to the public through the newspapers. Each ballot provided an opportunity to vote for 8 performers in different classifications. More than 25,000,000 individual votes were recorded. A force of 93 tabulators were given the stupendous job of recording these votes in a short period, and over 100 persons were necessary to handle the volume of mail which came from all parts of the country.

The purpose of the Poll was to learn the interest in the stars and their technique and to furnish some reliable index of the public's preference for various types of programs. This is the first time that any serious nationwide Poll has been conducted to record the basic facts for the guidance of the radio industry.

After being accorded the signal honor of luncheon at the National Press Club, the stars and other members of the American Bosch party were escorted to the White House for a personal interview with President Hoover.

## R.C.A. Gets Police Contract

THE City of Baltimore will soon be the next large American city to adopt radio in police work, according to an announcement that the Baltimore Police Department has awarded a contract to the RCA Victor Company for the installation of a complete and modern police radio system.

## Some Say Yes—Some Say No

"VARIETY," one of the country's leading theatrical publications, recently made the assertion in its columns that dramatizations, such as those presented on the Tuesday evening Magic Carpet Programs, are a bad influence on the youth of the country.

It is the contention of the sponsor of this program, that, aside from the entertainment value of these presentations, which is extremely high, judging from the generous public interest that has been manifested in fan mail and press notices, such dramatizations, far from doing any material damage morally to American youth, inspires a sense of duty to the law and justice.

In every single presentation thus far, the fact that the criminal can't win, that retribution is inevitable and the minions of the law through the use of modern science and crime detection methods are prepared to combat effectively the criminal element at all times, has been emphasized and brought home the more strongly through these dramatizations of actual cases.

# R. M. A. Association News

## RMA Offices Moved

On January 10 the office of the Radio Manufacturers Association was moved from Chicago to the American Building, 1317 F Street, N.W., Washington, D.C., in charge of Bond Geddes, Executive Vice-President & General Manager. Members of the Association and others are requested to note the change of address in their records and address all RMA communications to the new address—American Building, 1317 F Street, N.W., Washington, D. C.

## Wide Use Begun of RMA Official Seal

RECEIVING sets bearing the new official seal of the RMA now are being distributed to the trade and the public.

Many thousands of the new RMA seal already have been ordered by members of the Association. The seal plan has met wide and immediate favorable response not only from manufacturers of the RMA, but also from many jobbers and dealers. Even the U. S. Department of Commerce has taken favorable note of the new RMA plan for placing "certified" seals on receiving sets of its members and interest also has been displayed by other industrial and trade bodies, such as the Consumers' Research organization.

RMA members now affixing the certified seal to their receiving sets include many of the leading set manufacturers. Others have advised Association headquarters of their early adoption and use of the official seal. President Williams of the RMA, Chairman Murray of the Set Division and other Association officials are much gratified over the initial and most favorable receipt not only by members, but by the trade, of the official seal plan. Jobbers and dealers have manifested very hearty approval of the RMA seal plan and expressed their desire to assist in promoting sales of sets bearing the RMA seal.

In addition to the metal RMA seal, the Association is now arranging to secure seals of paper or other composition which may be desired by members.

The RMA seal is being registered as the Association's trademark with the U. S. Patent Office at Washington so that its use and benefits may be reserved for RMA members only.

The U. S. Department of Commerce at Washington requested full information regarding the RMA seal. The Department of Commerce advised the RMA of the great success enjoyed by other industries and trade associations in adopting similar "certification" plans in promoting public use and acceptance of their products. Plans of "certifying" the products similar to that of the RMA have been used successfully according to the Government authorities, by seventy-four other trade associations and industries.

## Parts Manufacturers Meet At Cleveland

FIFTY executives and engineers of RMA parts manufacturers are meeting at Cleveland Friday and Saturday, January 6 and 7, for important discussions on manufacture and standardization of parts. The meetings

were arranged by Chairman Leslie F. Muter of the RMA Parts and Accessory Division, and Chairman Virgil M. Graham of the Standards Section of the RMA Engineering Division.

Both merchandising and engineering problems are on the schedule for consideration. There will be separate meetings of executives and engineers of the parts makers, with joint meetings to consider the related merchandising and engineering problems. Chairmen of the various divisions and groups of parts manufacturers have been appointed for intensive work on standardization of various units.

## RMA Traffic Managers To Discuss Lower Rates

A CONFERENCE of traffic managers of the RMA with the Consolidated Classification Committee of the Carriers has been arranged for Monday, January 30, at the Chicago offices of the Classification Committee. Minimum carload rates and less than carload rates will be considered in the effort of the RMA to secure reductions. Members of the RMA Traffic Committee and also all traffic managers of other RMA members not represented on the committee are invited to be present at the January 30 conference.

Following the suspension of the RMA Traffic Bureau, announcement is made of the resignation of Mr. W. J. M. Lahl, for four years manager of the RMA Traffic Bureau, effective January 31. Mr. Lahl will remain in radio traffic work in a private capacity. Traffic interests of the RMA will be continued by its Traffic Committee, of which Captain William Sparks of Jackson, Mich., is chairman.

## "Hum" of Broadcast Transmitters

THE movement for co-operation between broadcast engineers and those of receiving set manufacturers on the problem of "hum" of some broadcast transmitters in various sections of the country is being forwarded by the National Association of Broadcasters and the RMA. Director Loucks of the broadcasters' organization will soon present to the NAB Board of Directors the proposal from the RMA for a joint meeting of broadcast and receiving set engineers to consider efforts for reduction of interference caused by transmitters.

## Radio Interference Committee Meets

ANOTHER meeting in New York on January 27 of the Joint Co-ordination Committee of the National Electric Light Association, the National Electrical Manufacturers Association and the Radio Manufacturers Association has been called for further work on radio interference problems. Tobe Deutschmann of Canton, Mass., is chairman of the RMA Interference Committee with Dr. C. E. Brigham of Newark, N. J., Director of the RMA Engineering Division. Several reports on reduction of radio interference are in readiness for publication under the auspices of the three co-ordinated trade organizations.

## Switzerland Provides Radio Quotas

FOLLOWING the action of France, the Swiss Government has established import quota restrictions on radio and other products effective January 1, according to a cablegram to the U. S. Department of Commerce from the American Commercial Attache at Berne. The Swiss import control system provides allotment of quotas to individual countries, which are not made public, and requires import permits for each shipment.

## Administration of French Import Quota Arranged

THE RMA has been advised by the American Chamber of Commerce at Paris of administrative arrangements for operation of the radio import quotas on shipments of France. The American Chamber of Commerce at Paris states that it intends to do everything possible to maintain and increase, if possible, the American quota allotments in 1933 although there are reports also that France may adopt a prohibitive tariff on radio to build up manufacturing in France.

The quota plan arranged by the American Chamber of Commerce in France provides for allotments to radio exporters for each quarter of the year based on three factors: (a) the relative importance of the radio product in America determined by total 1931 output, (b) total exports to France of the manufacturer's product in 1931, and (c) actual monthly sales in France from June, 1931, to June, 1932. The method, it is conceded, is complicated but was agreed upon with the French Minister of Commerce after conferences with various representatives in France of American Radio Manufacturers. Provision is made in the quota administration for special cases where radio material had been held for a long time before October 1 in French customs houses.

The American Chamber of Commerce at Paris states that two most important results have been accomplished, in the equitable division of the limited quota among important radio manufacturers and the very definite obstruction to job-lot material sent to France.

"We are doing everything we can to encourage the establishment of definite agencies in France for reputable American makes of sets, tubes, and spare parts," the letter to the RMA from the American Chamber of Commerce states, "and in the future allotments will be made in each case only to authorized distributors when such exist. The Radio Manufacturers Association could help us in this matter by explaining the situation to its members.

"We have had expressions of satisfaction recently regarding the Chamber's handling of the radio quota from the American Commercial Attache, the French Minister of Commerce and the radio exporters and feel, therefore, that the basis of operation adopted is sound and should be continued as long as radio quota arrangements exist in France."

## NEW RADIO OWL IS WISE BIRD



THE Universal Microphone Co., of Inglewood, California, has placed upon the market recently, a novel "gadget" called the "Radio Owl", which shuts off the radio receiver after any desired period of time, from a few minutes up to two hours.

The Radio Owl operates silently and is entirely automatic. It can be used with power-operated or with battery-operated receivers. This patented device is a great convenience to those who like to listen to radio while in bed. It stands guard and turns off the receiver at the scheduled time without the intervention of human hands. Owners of the Radio Owl are constantly discovering new and practical uses for it. It can be used for turning off a night light and finds particular application in a child's bedroom, where a light is often required until the child has fallen asleep. The Owl can also be used to turn off small neon window signs, after the store has been closed for the night.

The principle of operation of the Radio Owl is as follows: When the Owl's body is pushed downward, oil at the bottom of a cylinder is forced past a piston. An internal spring then exerts an upward force on the body, but this action is retarded by the slow leakage of oil through the piston valve. All working parts are immersed in oil, eliminating any possibility of wear by friction or rust.

## Decline In Preferred Paper

Deferred Paper in United States off \$1,600,000,000 since 1929, shown in survey by Rex Cole, is one of best signs for prosperity's return in 1933, distributor holds; installment buying boom seen sure to follow any slight improvement in business next year; close of business in 1932 will show approximately \$1,300,000,000 paper outstanding against \$2,900,000,000 three years ago; paper dropped \$500,000,000 in 1930 and similar amount in 1931; biggest drop was this year with \$600,000,000 decline from 1931 high.

A DECLINE of approximately \$1,600,000,000 in deferred paper outstanding in the United States since 1929 through 1932, was estimated by Rex Cole, world's largest General Electric distributor, following a survey of installment buying extending over a period of four years.

That this decrease in time buying, which dropped from a high of \$2,900,000,000 in 1929 to about \$1,300,000,000 which he said would be shown at the close of this year's business, is held by Cole to be a good sign for 1933 improvement.

"It shows", Cole said, "that installment paper totals decline very much in step with the fall in general business, and indicates that this form of selling keeps in tune with economic conditions and is neither expanded nor contracted against the trend.

"It proves furthermore, that installment buying is a healthy American business practice.

"Any slight improvement in business should witness a wave of installment buying such as this country saw only in 1929. Replacements in most every commodity necessary to the American home maker are more urgent than ever before. The American public has done without many necessities too long, and it is my guess that they will awaken some happy morning with prosperity at hand and security again established, but most likely with a shortage in many lines which obviously will start things humming again."

Installment paper outstanding in 1930 showed a total at the close of the year's business of \$2,400,000,000. The following year this dropped \$500,000,000 to \$1,900,000,000 in 1931. The close of 1932 business will be off approximately \$600,000,000 in deferred paper outstanding, making a total in all lines of about \$1,300,000,000, Cole's survey, which was conducted through finance corporations, and industries-distributing through this system, showed.

## Big Retailers Take On Howard

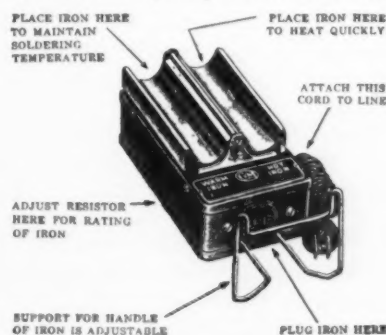
THE combined capitalization of eleven of Howard Radio's newly franchised dealers is fifteen million dollars. They include Lyon & Healy, Chicago; Jenkins Music Co., Kansas City; Grinnell Bros., Detroit; Schmoller & Mueller, Omaha; Denton, Cottier & Daniels, Buffalo; Strouss-Hirshberg, Youngstown; Herb & Myers, Sandusky; C. H. Yeager, Akron; Armstrong Furniture Co., Memphis; Spear & Co., Pittsburgh, and Rosenbaums, Pittsburgh.

These retailers are a few of the hundreds the new Howard sales organization is selling direct from the factory at South Haven, Mich.

## New Soldering Iron Stand

G-M Laboratories, Inc., 1735 Belmont Ave., Chicago, have announced a new type of soldering iron stand that effects a saving of 30-40 per cent in power consumption and overcomes many of the principal soldering troubles. The most serious difficulties in soldering work result from an overheated, dirty iron, and much defective soldering results from the tip of the iron becoming pitted and corroded from excessive heat. By keeping the iron, when not actually being used, at just the right soldering temperature, the G-M Stand corrects this trouble and the tip of the iron will remain well tinned for weeks.

The G-M Soldering Iron Stand has two cradles. When placed in the left hand cradle the iron receives only sufficient voltage to keep it at the minimum and yet proper soldering temperature for immediate use. The result is a material saving of power and greatly increased life of the heating element. When the iron is either in actual use or is placed in the right hand cradle, full line voltage is automatically applied to keep the iron up to temperature. The elimination of overheating with all its attendant evils together with the saving in power consumption are features which more than justify the cost of the stand.



## THE MAGNAVOX NEW YEAR "CARD"

### HAPPY NEW YEAR!

### How Times Do Change!

YOU AND I remember when a good fat hen could be bought for a quarter, and a rooster for less; when eggs were three dozen for a quarter, and milk five cents a quart; when you could buy enough porterhouse steak for two bits to feed the whole family; when bacon was only "po' folks" food, and the butcher gave liver away and treated the kids to bologna; when the hired girl worked for \$2.00 a week and did all the family washing; when women wore bustles and hair, and too many clothes for convenience, and didn't paint or powder in public, smoke cigarettes, vote or shake the shimmy; when men wore whiskers and suspenders and boots, chewed tobacco and cussed; when "Old Crow" was ten cents a shot and beer five a schooner, and the lunch was generous and free; when folks worked ten to fifteen hours a day, and never thought of going on a strike.

Tipping the waiter was unknown and you didn't have to buy your hat back every time you checked it. The hanging kerosene lamp in the hall and the stereoscope in the parlor were the acmes of luxury. People were not operated on for appendicitis, nor were their veins shot full of serums, and men didn't buy monkey glands, nor have their germs subjected to the microscope.

At that, people lived to a good old age and traveled miles through the snow to the jingling cadence of sleigh bells, to wish their friends A HAPPY NEW YEAR! BUT ALAS! ALSO ALACK! Today everybody goes speeding around in high powered autos at 50 per, sailing through the air at 150, spending most of their time playing golf or the saxophone, shoot craps, play the stock market, make home brew, smoke cigarettes, and cuss the neighbors for the high cost of living these glorious days when business roars and religion snores, and the women are all legs and no hair, and what clothes they consent to wear leave mighty little to the imagination; they do more than half the voting and spend all the pay check.

Folks now-a-days go to the movies twice a day, patronize night clubs, pay \$5.00 for fifty cents worth of food, drink wood alcohol and muriatic acid at \$10.00 a quart, dance to the jazz of a jungle band and think they are having a devil of a time because they never go to bed the same day they get up.

Take it from me, after the average guy has paid the installments on the piano, the auto, the radio, the vacuum cleaner, the washing machine, the electric refrigerator, the Louis the Limit boudoir suite, to say nothing of the taxes, insurance, interest, and assessments on his humble happy home, there's darned little left to buy gasoline for Dad. These are the days of the suffragette, profiteer, installment man, rent hog, income tax and prohibition. Yet, despite it all, life is sure worth living, and

WE WISH YOU  
A HAPPY NEW YEAR!

# Short-Wave Antenna Design and Construction

By Don C. Wallace, Winner of the Hoover Cup

**F**EW people realize what a pronounced improvement in reception is had from the use of a properly designed short wave antenna system. It must be correctly laid out, correctly built and correctly installed in the proper place.

The best location for an antenna is on or over vacant property. A "back lot" antenna is superior to one that is stretched across the housetops. The unusually large network of house-wiring, all of which is directly, inductively or capacitatively coupled with all of the electrical devices in the city, picks up noises which are inherent in the wiring system but which are not picked up a few yards distant.

Too many treatises on antenna systems deal with the subject in a vague, general manner. Actual dimensions are left to guesswork. This article gives **exact dimensions**, their importance being such that the success of short wave reception depends upon them to a greater extent than the average experimenter is aware of. A surprisingly large number of new stations will be heard if the proper short wave antenna system is used.

The dimensions and placement of the antenna are more important than the kind of wire used. The ideal antenna wire is that of the largest size, consistent with the ability to erect and permanently suspend it in the proper place. Conditions too often do not permit the use of large wire, neither will the pocket book afford it. A compromise must be made. Radio, in all its branches, is a compromise . . . between convenience, cost, time, ease of construction and operation, availability of material, knowledge of the subject, inherent inhibitions against things "new" or those that differ from the traditional. This article deals with the successful and practical compromise of antenna systems that are within the reach of all.

## The Size of Wire to Use

**I**N order named are the practical sizes of antenna wire which are best suited for short wave reception:

1. #6, #8 or #10 solid copper enameled wire for the flat top portion and #12 enameled wire for the feeder system.
2. #12 solid copper enameled wire for both the flat top and feeder system.
3. #14 solid copper enameled wire for both the flat top and feeder system.

Wire smaller in size than #14 is not strong, mechanically. It will not permit of "full stretching" when pulled taut. As a last resort #16 enameled wire could



DON C. WALLACE  
*Short waves are his specialty*

be used with perfectly satisfactory results. In general it is suggested that #12 wire be used for spans of more than 100 feet and #14 for spans of less than 100 feet. Enameled wire is the more practical to use. Radio frequency currents have a tendency to travel on the surface of the wire. Bright new copper wire would be best if it could be made to retain its shiny finish. The R.F. (Radio Frequency) currents travel with minimum loss on a bright surface, the antenna system radiates with greatest ease, and maximum efficiency is the result. However, corrosion on the surface of the wire will increase the resistance to these minute R.F. currents and within 48 hours the corrosion will be so far advanced as to lower the efficiency of the antenna.

In the early days of radio, Saturday was antenna cleaning day. Several of the more enthusiastic would lower the antenna and polish the wires with steel wool. Steel wool was not pleasant to handle and a pair of old leather gloves was donned to prevent the fine particles of steel wool from entering the flesh of the hands.

Theoretically, the corrosion of copper wire, if sufficiently corroded, is just as good an insulator as an enameled coating. But too often the corrosion is unevenly distributed and, therefore, of uncertain effectiveness. Consequently, enameled covered wire is ideal for a short wave aerial.

Other coverings may be used, such as rubber, weatherproofing, paraffin cloth, cotton or silk, or any other covering of a good insulating quality.

The span of copper is all-important, the covering of the wire of secondary importance. The covering for portable aerial of station W6ZZA is a double layer of silk cloth woven over a large number of strands of carefully cut-to-size loop wire. Both the flat top portion and the feeder system use this kind of wire. One of the feeder wires is green silk covered loop wire, the other feeder is brown, making it easy to prevent the feeders from becoming entangled when the portable aerial is erected on a hotel roof after dark. This flexible loop wire is not as good as enameled wire but it permits of speedy installation and enables the operator to wind the antenna around the lid of a cigar box when it comes time to check out of the hotel.

It is repeated here that solid copper wire is specified for short wave aeri-als. Stranded wire offers more surface, lower resistance to the R.F. currents on the broadcast band. But it is not as good as solid wire for short wave reception. This is because the higher frequencies (short waves) alternate so many times per second that certain losses are introduced when uneven-surfaced wire is used. The high frequencies tend to jump from wire to wire (stranded wire is twisted) rather than to follow the twists of the wire. Solid copper wire eliminates this "jumping" tendency, thus making an easier path for the flow of HF (High Frequency) currents. Therefore, solid copper wire is recommended.

These details may seem commonplace and "finicky" to some. But it must be remembered that improvements and corrections in radio design multiply rapidly.

## A 2408% Increase in Efficiency

**I**F we make a 2% improvement in the kind of antenna wire used, a 2% improvement in antenna insulation, a 2% improvement in antenna dimensions, a 2% improvement in antenna placement, a 2% improvement in antenna coupling to the receiver, a 2% reduction in noise pick-up, a 2% improvement in receiver coil design, a 2% improvement in the tuning condenser, a 2% improvement in the grid leak, a 2% improvement in the shielding, a 2% improvement in the placement of the receiver in its housing, a 2% improvement in the radio frequency choke coil, a 2% improvement in the tube and coil sockets and con-

tacts, we will then have a total improvement of  $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2048\%$

A 2% improvement in six of these places, or  $2 \times 2 \times 2 \times 2 = 32\%$ , will not be perceptible to the human ear. Individually, these 2% improvements will result in no audible increase in volume, individually they are of no consequence. Collectively, the sum total of 2048% is what counts. This increase in efficiency will enable you to hear more stations, from more countries, with more volume and with greater ease. It is evident, therefore, that these little 2% increases, when multiplied, are of far-reaching importance in the total effectiveness of the completed receiver. Additional increases in efficiency are gained from the proper insulation of the antenna.

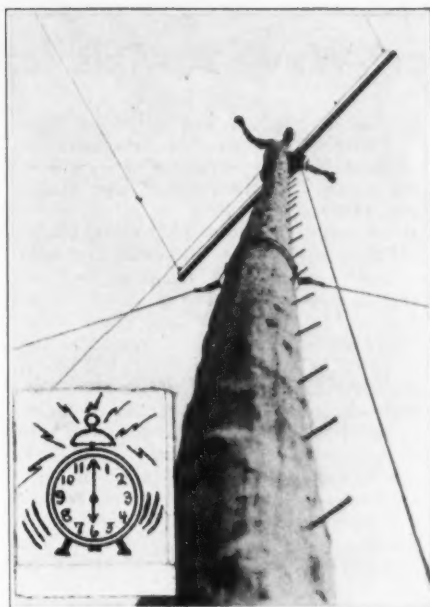
An antenna designed to deliver utmost performance at a certain frequency (wavelength) operates at peak efficiency only if tuned to its exact wavelength. At other wavelengths it does not deliver the same efficiency. Improper or poor insulation not only tends to distort the actual dimensions of the antenna but the antenna actually does not know where it terminates. Poor insulation is partly conductive. Thus the antenna has no definite terminating point. Like other things in radio, there is a difference of opinion as to the merit of various well-known insulating materials and the proper placement of the insulation. In practice we cannot resort to the last word in insulation because it is awkward, expensive, troublesome and the improvement which it offers over and above the accepted and commonplace method of insulation is not of sufficient importance to detract from the effectiveness of the properly designed all-around short wave antenna system.

### Insulating Materials

THE best insulating materials for antenna are silk, linen, cotton, or woven strands of these materials. They should be free from coloring because the base of all coloring is of a conductive nature. When silk, linen or cotton become wet the impurities in the material, plus the natural impurities in the air, introduce conductiveness and a consequent lowering of the insulating qualities of the material. The quality of insulation can be preserved by boiling the material in vaseline. In time the sun will melt the vaseline and the useful life of our "perfect insulator" is from six months to one year.

Obviously, this perfect insulator is not practical and once more we resort to the time-worn radio compromise by using glass for antenna insulation.

Those who can afford to pay a little more for better insulators are advised to use PYREX. Good porcelain, finely grained, well baked and completely



*The Author atop one of his "sticks"*

glazed, is the next best thing to use. Glass is the nearly perfect insulator and is an ideal compromise for short wave antenna. Glass insulators can be procured from your parts supply house.

As a possible alternative a maple dowel stick can be used. It should be from  $\frac{3}{8}$ " to  $\frac{1}{2}$ " in diameter, one foot in length, boiled for an hour or two in paraffin. Like the vaseline-boiled linen insulator, these dowel sticks are at the mercy of the weather, dust and soot particles will accumulate on the dowel surface and the effectiveness of the insulator is then considerably reduced.

Portable W6ZZA uses cotton string for insulation. A ball of string is thrown over an elevator shaft or penthouse, hoisted to the top of a flag pole or attached to some other convenient support. Because the cotton string is used but once it is not affected by rain or moisture and a negligible amount of soot and dirt will accumulate on its surface. Cotton string makes a perfect short wave antenna insulator, most convenient in its application, will retain its insulating qualities for an entire week. Given a quick jerk it will break easily and down comes the aerial. The aerial is then rolled over the lid of a cigar box and thrown into a suitcase when checking out of the hotel. But this cotton string insulation is intended for portable use only.

Glass, being our perfect compromise for a permanent antenna installation, can be had in the form of insulators 3" in length. The standard Pyrex Glass insulator if of that length. Longer glass insulators can be used.

Rope should be used for hoisting the antenna. Cotton rope is a better insulator than hemp. Do not use wire. It picks up noises from nearby wiring. The rope hoist is attached to the insu-

lators on each end of the antenna. Real enthusiasts can boil this rope in vaseline, thereby weatherproofing the rope and preventing it from contracting and expanding with changes in humidity.

The hoist rope usually runs through a pulley, attached to a pole on the house or in a vacant lot. Do not fasten the rope to the base of the pole. Tie a window sash weight to the end of the rope, thus permitting the rope to contract several feet during a heavy rain or fog. The weights "go up the pole" as the rope contracts. The pole will not bend, the rope will not break, and there is less wear and tear than when the rope is attached to the base of the pole. Window sash weights can be obtained from any hardware dealer. They are good looking. The weights used at the Wallace station, for holding a 612' antenna taut, are the 34-pound size. By using these weights the top of the pole is never subjected to a strain of more than 34 pounds.

### Placement of the Antenna

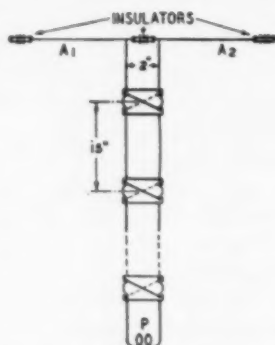
AN antenna to be most effective must be in the clear. The placement of the antenna is of utmost importance. It should be as high as possible, not too close to houses or other large objects, as far removed from lighting circuits and telephone lines as possible. Too often such an ideal condition cannot be found for the erection of the average antenna.

For those who cannot erect the "last word" in a short wave antenna there are numerous satisfactory substitutes, any of which will give infinitely better results than the antenna which may at present be used. The best is always worth striving for. Do not be satisfied with a compromise if it is possible for you to erect one of the better types.

To ascertain the correct dimensions of an antenna the use of a half wave is resorted to; the figure 1.56 x the wavelength. Because of the size of the antenna wire used, capacity to earth and various other corrections, it is not possible to use the straight meter system and transpose it into feet and expect to find the wavelength of the antenna proper. The figure 1.56 is accepted as an average, being the result of a large number of tests made from antenna which have been carefully tuned by means of oscillators. Inasmuch as the amateur short wave bands are in harmonic relation with each other, the antenna sizes can be selected with regard to their convenience. The two most widely used short wave broadcast bands are not in harmonic relation to each other. It therefore becomes necessary to adopt the 26 or 49 meter band as a standard. However, we also want to hear all of the other stations that are spread over the short wave spectrum.

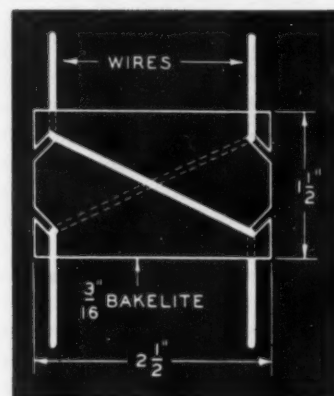
(Please turn to next page.)

## The Ultimate in Short-Wave Aerials for General Purposes



**H**ERE is shown the typical "compromise" short wave antenna system suitable for covering the entire band of from 20-200 meters. The flat-top portion,  $A_1$  and  $A_2$  must be cut to exact length.

Each of the wires,  $A_1$  and  $A_2$ , is 33'-6" long, #14 enameled copper. The 3 insulators are of glass. Note the "feed line" coming down the center. The feed line is also of #14 enameled copper wire. It is transposed about every 15 inches with a TRANSPOSITION BLOCK, as shown in the illustration to the right. The lead-in, or "feeders" as they are called in short wave practice, are to be 66 feet long (each wire). These feeders are spaced 2" apart and held in place by the transposition blocks. In the antenna illustration "P" is a coupling coil which couples the antenna to the receiver. The ground wire is removed from the receiver. The ideal short wave receiver does not use a ground. The aerial here described is a "compromise" aerial because it is designed to operate most efficiently on a wide group of short wave channels. Next month's "RADIO" will show antenna de-



sign for maximum results at various individual frequencies.

We therefore design an antenna that is particularly well adapted to bring in, with greatest volume, the stations on the popular short wave bands, thereby greatly improving the results which will be secured when listening for stations in other parts of the spectrum. A most gratifying improvement will be noticeable on all of the bands.

### Transposition Blocks

**T**RANSPOSITION blocks for the antenna feeders can be made from various insulating material. Bakelite is cheapest, can be purchased in suitable block form, as shown in the illustration. Porcelain blocks are better than those made from Bakelite. The feed

lines are transposed by means of these blocks. Cancellation takes place throughout the length of the feed lines where insulation is not quite as important as in the antenna proper.

The ideal transposition blocks for short waves would be those of glazed porcelain. These will soon find their way into the radio market. The transposition blocks should be spaced from 15 inches to 36 inches apart. A space of 2 feet between blocks seems to be the accepted compromise. The exact size of the transposition blocks is not important. Any size, from 1" square to 8" square will suffice. The larger blocks must be spaced far apart, the smaller blocks close together. Large blocks of-

fer added resistance to wind pressure. Small blocks are more suitable for general requirements.

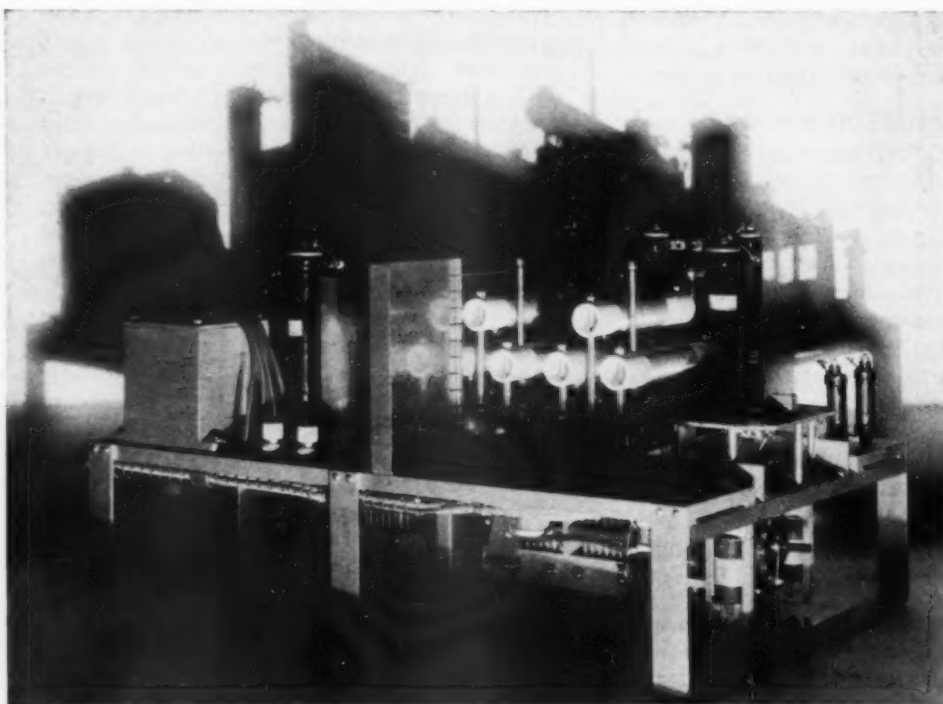
Determine the proper size of the antenna by measuring the wires with a tape or yardstick. Stretch the enameled antenna and feeder wires. It is not necessary to cut the antenna wires where they meet the feeder wires. Reeve the antenna wires through the glass insulator in the center of the antenna and continue these for use as feeders. Fasten the aerial wires to the insulators with short pieces of wire, made into the form of a loop and soldered, thereby insuring a "definite ending," as explained previously in this article.

(To be continued next month)

### Announcement

The second installment of "Short Wave Aerial Design and Construction" will be in next month's "RADIO".

Directional systems, tuned antennae, noise elimination and dozens of other vital subjects will be discussed. Some fine sketches will accompany the next installment.



The 1933 style in short wave equipment. Here is shown one of the numerous stations just installed for the Tropical Radio Company for radio-telephonic short wave communication with the vessels of "The Great White Fleet"

# For The RADIO NOTE BOOK



## PHILCO

### SERVICE & TROUBLE SHOOTING INFORMATION



Compiled By Philco Service Engineers—Each Month—For "RADIO"

#### Philco's Service Policy Popular

That Philco's policy of co-operation with the independent service men is meeting with approval of this group is attested by the receipt of hundreds of letters by the Pacific Coast Philco Branch, says Mr. Farwell, the Coast Service Supervisor.

"In all parts of the United States, Canada, Hawaii, Australia and other foreign countries the service men agree with us that the independent group is worthy of our belief that they comprise an important part of the industry.

"Following our factory service meetings last June, which were opened to all service men, we have been deluged with requests for service bulletins, parts prices and other data sheets. These are generously supplied as long as a supply is available.

"This policy has not only created tremendous goodwill but has resulted in a considerable parts business being built up. Not only does Philco advocate 'genuine Philco parts for Philco receivers', but goes further and shows how to use these quality parts for general replacement service.

"We are pleased to announce that Philco will continue its policy throughout 1933 and will mail to all service men who desire it, our monthly service publication, the PHILCO SERVICE-MAN, as well as other technical bulletins. To receive this service, address Philco Radio and Television Corp., 218 Fremont St., San Francisco, California."

□ □ □

#### Radio Beacon Interference

On some of the earlier Model 70 and 90 sets, difficulty has been experienced with interference from airport radio beacon stations, transmitting at or near 260 K.C. Last year when these models were being sold, the interference was not present, but during the past year, several new beacon stations have been installed.

The interference can be readily eliminated by readjusting the I. F. compensating condensers at 250 or 270 K.C. instead of 260 K.C. The Philco 095 oscillator can be re-calibrated at 250 by tuning in a reliable broadcast station signal at 750 K.C. (third harmonic of 250 K.C.) or 1000 K.C. (fourth harmonic); substituting the oscillator for the aerial, and readjusting the 260 K.C. compensating condenser of the oscillator until the signal is heard and the output meter reads maximum.

□ □ □

#### An Easily Constructed Low-Range Ohmmeter

The ordinary volt-ohmmeter which is commonly used by many servicemen presents a difficulty when testing resistances below 100 ohms. Such low values as those of R.F. and I.F. transformers cannot be measured with such equipment with any degree of accuracy. The handy ohmmeter described below can be used for work of this type and will be found extremely convenient in measuring resistances below 100 ohms.

The ohmmeter is a 0-1 milliamperes range milliammeter, connected as shown in the diagram. The other parts needed are a 5000-ohm Philco volume control, Part 5839, a 4½-volt C battery, and a pair of test prods. Standard 1 mil. range milliammeters such as the Weston Model 301 or the Jewell pattern 88 have a resistance of 27 ohms.

The 5000-ohm variable resistance is adjusted until the meter reads full scale without any resistor connected across the test prods. It can be seen that the scale reading for the ohmmeter is from left to right instead of from right to left, as in the case of the ordinary ohmmeter. With an infinite resistance across the test prods full scale reading will be obtained. When the resistance across the test prods is equal to that of the meter, half-scale deflection will be obtained, since in an equally divided parallel circuit of this type the current is equally divided. The formula for calibrating the meter scale in ohms is

$$X = \frac{ra}{100-a}$$

Where X = unknown resistance

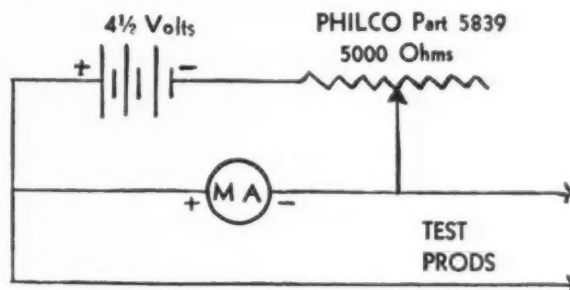
r = resistance of meter

a = current through meter expressed in per cent of total scale deflection. (If meter reads .5 ma, this is 50 per cent; if reading is .2 ma, this is 20 per cent, etc.)

We can work out the example of a half-scale reading mentioned above in the following manner:

$$X = \frac{35 \times 50}{100-50} = 35 \text{ ohms}$$

The meter, the battery and the volume control can all be mounted in a single case, making a convenient and portable test unit.



#### QUESTIONS and ANSWERS

Q. What is the purpose of the "sensitivity" compensating condenser in the Model 80?

A. This condenser, which is fitted with a fiber adjusting nut, is provided to increase the sensitivity of the circuit by introducing feed back into the second detector tube. The adjustment should be made in such a way that the set will have maximum sensitivity at all broadcast frequencies without oscillating, at any point on the dial.

▽ ▽ ▽

Q. What is the difference between the two types of electrolytic condensers used in the Model 80?

A. One of these is the dry type, and the other is the wet type. The wet type indicated at (34) in the diagrams of Service Bulletin No. 140 is Part No. 7558. The corresponding dry type, which is interchangeable with the wet, is Part No. 7464. The wet type indicated at (35) is Part No. 7467. The corresponding dry type which is interchangeable with the wet is Part No. 7441. The standard electrolytic condenser test is used for each type.

▽ ▽ ▽

Q. How can a volume control be placed on the R-3 Speaker?

A. A 50,000 ohm volume control, Part No. 4513, can be connected across the extension line before the output transformer of the R-3. One side of the output transformer primary is connected to the center point of the volume control and the other side of the primary connects to the end of the control. The control can be mounted on the side of the cabinet.

▽ ▽ ▽

Q. What is the cause of little or no change in the width of the shadow on Philco Models with shadow tuning?

A. This is because the aerial is too small or inefficient. It is necessary that a signal of fair strength be received on the aerial to operate shadow tuning satisfactorily. If practically all of the volume is made up by gain through the I.F. amplifiers instead of by a larger input signal, the amount of change in width of the shadow will be a minimum.

▽ ▽ ▽

Q. What is the purpose of shorting the bucking coil in some of the Model 80 sets?

A. This shorted coil has been found effective in eliminating hum in certain sets of this model. The effect is essentially that of an extremely low resistance coil for hum bucking. It is effective when complete elimination of the coil is not.

# for The RADIO NOTE BOOK



## CROSLEY SERVICE & TROUBLE SHOOTING INFORMATION



Compiled By Crosley Service Engineers---Each Month---For "RADIO"

### Crosley Receiver Model 148 "Fiver" and "Fiver Lowboy"

THE Crosley model 148 receiver is a five tube Superheterodyne receiver using one -58 tube as Modulator-Oscillator, one -58 tube as an intermediate frequency amplifier, one -57 tube as a second detector, one -42 tube as output amplifier, and one -80 full wave rectifier. This receiver is designed to operate on stations operating between 550 and 1750 kilocycles, which includes the police broadcast on the 1700 kilocycle band.

The chassis is mounted in the cabinet supported by four absorbing rubbers. When installing this receiver unloosen the four mounting screws allowing the chassis to rest freely on these shock absorbing rubbers. Do not remove screws.

Alignment of the intermediate frequency amplifier and condenser gang is obtained in the usual manner. An intermediate frequency of 456 kilocycles is used in peaking the intermediates.

To align the intermediate frequency amplifier connect the "ANT" terminal of the local oscillator to the control grid of the I. F. amplifier tube (2). Connect the oscillator "GND" terminal to ground of the radio chassis. Turn the receiver dial to maximum capacity. Connect the output meter across the primary terminals of the speaker output transformer. With the local oscillator adjusted accurately to 456 kilocycles adjust the I.F. trimmer condenser "C" to maximum deflection of the output meter. Remove the oscillator "ANT" lead from the I.F. amplifier tube and connect to the control grid of the Modulator-oscillator tube (1). Adjust the I.F. trimmer condensers (A) & (B) to maximum deflection of the output meter.

To align the padding condensers on the condenser gang, turn the receiver dial to 1400 kilocycles. Connect the local oscillator terminals to "ANT" & "GND" of receiver. Adjust the local oscillator to emit a signal at

1400 kilocycles. Adjust the padding condenser "D" to maximum deflection of the output meter. Adjust padding condenser "E" to maximum deflection. Condenser "D" tunes the oscillator and "E" tunes the first detector. If the above procedure has been followed the receiver should be perfectly aligned.

\* \* \* \* \*

If the receiver should fail to operate on the low frequencies, but operates on the high frequencies, check the type -58 modulator-oscillator tube which will be found low. Replace with a good -58 tube.

In early chassis of this model a hum may be noticed on the carrier wave of each station. To correct this trouble install a .006 mfd. to .05 mfd. fixed condenser between the A.C. supply cord and ground of chassis within the chassis. A good ground will also correct this trouble.

In replacing pilot light bulbs use only a 6 to 6.3 volt pilot light bulb.

The filaments of the -57 and two -58 tubes are connected in series supplied by a transformer secondary winding delivering 7.5 volts.

### THE CROSLEY FIVER

In the Crosley Fiver, you obtain a genuine FIVE-tube Superheterodyne chassis that is non-regenerative, neutralized, and completely balanced at the factory. Tubes used include the new Heater Type Tubes, and are as follows: One type -58 tube as oscillating modulator, one type -58 tube as intermediate frequency amplifier, one type -57 tube as second detector, one type -42 output tube, one type -80 rectifier tube. These five tubes virtually eliminate regenerative whistles and squeals usually found in radios with less than five tubes. Sensitivity is greater because it is inbuilt at the factory. Other features are an illuminated dial and a dynamic speaker. The cabinet is beautifully finished in Adam brown and the front is decorated with a genuine walnut veneer overlay. Dimensions: 14" high, 11½" wide, 8" deep.



End  
bad tube  
troubles

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SET TESTED Tubes

for  
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# THE RADIO BUYERS' GUIDE OF "RADIO"

JANUARY, 1933

THE NATIONAL TRADE MAGAZINE

Who Makes It . . . Where to Buy It . . . What It Costs

## DUAL-WAVE RECEIVING SETS

### ALL AMERICAN

All-American Mohawk Corp.  
North Tonawanda, New York.  
Model SW-80, \$89.50, list.  
7 tubes. Console 14-550 Meters.

### ATWATER-KENT

Atwater-Kent Mfg. Co.  
2700 Wissahickon Ave., Philadelphia, Penn.  
Model 480, \$104.50, list.  
9 tubes. Semi-Highboy. 15-550 Meters.

### CAPEHART

Capehart Corp., Ft. Wayne, Ind.  
3 models, Nos. 11-12 and 14.  
\$269.50; \$279.50; \$299.50.  
Each has 10 tubes. Highboys. 15-545 Meters.

### CENTURY

Century Radio Products Co.  
3009 N. Austin Blvd., Chicago, Ill.  
Model 5-47SW, prices on request.  
5 tubes. Mantel type. 75-550 Meters.

### CRESCENT

Crescent Radio Mfg. Co.  
1026 - 2nd Ave., Minneapolis, Minn.  
Model-Auto radio. \$59.50, list.  
6 tubes. AC or Battery types. 80-550 Meters.

### CROSLEY

Crosley Radio Corp., Cincinnati, Ohio.  
Model 136-1-2-S, \$75.00, list.  
Model 136-1-2-PA, \$89.50, list.  
Former is chest model, latter is console. Each  
has 10 tubes. 17-560 Meters. 9-2-FF.S.W.  
Adaptor, chest, \$22.50. 17-200 Meters.

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### DAVISON HAYNES

Davison-Haynes Corp., 1730 Venice Blvd., Los  
Angeles, Calif.  
5 tube compact super, short-long wave set,  
\$29.95, 7 tube mantle type, all wave, \$44.50;  
7 tube console, all wave, \$59.50.

### DUMONT

Dumont Electric Corp.  
42 West 17th Street, New York, N. Y.  
Model 904. List price, \$49.50.  
9 tubes. Chassis only. 200-2000 meters.

### ECHOPHONE

Echophone Radio Mfg. Co., Ltd.  
104 Lakeview Ave., Waukegan, Ill.  
Model 10, \$59.50, 7 tubes, Midget, 17-550  
meters. Model 15, \$69.50, 7 tubes, Midget,  
17-550 meters. Model 20, \$89.50, 7 tubes,  
Lowboy, 17-550 meters. Model 35, \$159.50,  
11 tubes, Lowboy, 17-550 meters.

### EMERSON

Emerson Radio & Phonograph Corp.  
641 - 6th Ave., New York, N. Y.  
Model AW-55, \$55.00, Midget, 6 tubes.

### FADA

Fada Radio & Electric Corp.  
Long Island City, N. Y.  
Model 66, \$109.50, 9 tubes, Console.

### FEDERATED (Acratone)

Federated Purchaser, Inc., 25 Park Place, New  
York, N. Y.  
Mod. 91, \$15.25, Midget, 5 tubes, 75-600 met.  
Mod. 92, \$16.75, Midget, 5 tubes, 75-600 met.

### FERGUSON

Ferguson Radio Corp., 34 E. 12th St., New  
York, N. Y. Special 200 to 2000 meter set.  
Type BL-61, price on app. 6 tubes. Midget.

### GILFILLAN

Gilfillan Bros., Inc., 1815 Venice Blvd., Los  
Angeles, Calif. Model 12, \$99.50. Console.  
10 tubes. 15-550 meters. Model 10, 10 tubes.  
15-550 meters, \$79.50.

### GRIGSBY GRUNOW (Majestic)

Grigsby-Grunow Corp., 5801 Dickens Ave.,  
Chicago, Ill. Model 294. \$99.50. Lowboy.  
9 tubes. 15-550 meters.

### GULBRANSEN

Gulbransen Co., 816 No. Kedzie Ave., Chi-  
cago, Ill. Police and broadcast range.  
Model 3521. \$39.50. Mantel. 5 tubes. 75-550  
3525. \$49.50. Console. 5 tubes. 75-550

### HAMMARLUND

Hammarlund Mfg. Co., 424 West 33rd St.,  
New York, N. Y. Model "PRO", \$162.55,  
Table model. 8 tubes, 15-200 meters.  
"COMET", \$177.55, Console. 8 tubes, 15-550  
meters.

### HERBERT H. HORN (Tiffany Tone)

Herbert H. Horn, 1627 Hill St., Los Angeles,  
Calif. Price on request.  
Model 102, Console, 20-550 meters, 7 tubes.  
Model 110, Console, 180-550 meters, 7 tubes.

### HOWARD

Howard Radio Co., South Haven, Mich.  
CONVERTER. \$39.50. Chest type, 4 tubes.  
13-200 meters.

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# THE RADIO BUYERS' GUIDE

OF  
"RADIO"  
THE NATIONAL TRADE MAGAZINE

Who Makes It . . . Where To Buy It . . . What It Costs

## SHURE MICROPHONES AND ACCESSORIES



### New! CONDENSER MICROPHONE MODEL 42

Shure Condenser Microphone Model 42 has been produced to provide the highest quality instrument for Broadcast Studios, Sound Recording Studios, and Public Address Installations.

That our engineers have concentrated their years of microphone experience into the design of this model is attested by its appearance, performance, and low price.

Shure Condenser Microphones are already well known for their unusually rich quality of tone. With high sensitivity and a relatively uniform response to all frequencies from 40 to 10,000 cycles, they are free from "hiss" or other background noise. They may be moved about while in operation without adverse effects.

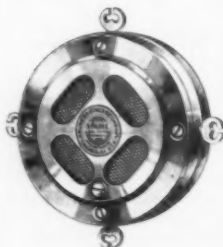
You may well wonder how a microphone with these characteristics can be produced at such a low price, especially when quality has not been sacrificed. Frankly, it's no secret. Here at Shure Brothers Company we devote our entire time to manufacturing microphones. Add to this, simplified construction plus lower material costs and you can see why finer quality could not be obtained at many times the price of the Model 42. Write for catalog sheet and complete specifications.

Model 42. Code: Rubis. List Price, complete with tubes and cable.....**\$125.00**

### MODEL 33N TWO-BUTTON MICROPHONE

This famous microphone is known for its:  
1. Accurate reproduction of music. 2. True, natural reproduction of the speaking voice.  
3. High sensitivity—low current. 4. Concealed buttons. 5. Protected diaphragm. 6. New "Quickway" hooks (patent pending).  
7. Artistic appearance.

Model 33N. Code: Rulit. **\$50.00**  
List Price, Reduced to.....



### MODEL 22N Two-Button Microphone

A large size high quality two-button microphone for Public Address Systems and Amateur Broadcasting. Retains all the new SHURE features.

Model 22N. Code: Rumac. **\$25.00**  
List Price .....

### HAND MICROPHONE MODEL 11N

A two-button microphone mounted in a specially designed case, complete with 6 ft. cord.

Model 11N. Code: Ruhaf. **\$15.00**  
List Price .....



### MODEL 5N Two-Button Microphone

Especially recommended for Public Address Systems in which price is the important factor. For an outstanding value in this price class it has no equal.

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## JACKSON BELL

Jackson Bell, Ltd., 6500 McKinley Ave., Los Angeles, Cal.  
Mod. 26-AV-SB, \$39.50, Midget, 6 tubes, 20-136 meters. Mod. 28-AV-SB, \$57.95, Midget, 8 tubes, 20-550 meters. Mod. 28-AV-SB, \$79.95, same as above, but in console.

## J. M. P. (Auto-Dial)

J. M. P. Mfg. Co., Inc., Milwaukee, Wis.  
ADAPTOR, S.W. \$12.50. 1 tube, AC or Battery. Steel casing.

## KENNEDY

Colin B. Kennedy Corp., 212 W. Ewing Ave., So. Bend, Indiana.  
Mod. 164-B, \$89.50, Cons., 10 tu., 15-550 met. Mod. 266-B, \$109.50, Cons., 10 tu., 15-550 met. "METROPOLITAN", \$29.50, 4 tubes, Police-broadcast band, AC or DC or UNIV.

## LOS ANGELES RADIO

Los Angeles Radio Company,  
944 South Broadway, Los Angeles, Calif.  
11 tube, midget case, \$59.50  
11 tube, console cabinet \$74.50

## MY OWN

My Own Radio, Inc., 1800 Grace St., Chicago, Ill. AUTO RADIO.  
Police and broadcast range, \$16.75, 5 tubes.

## NATIONAL

National Co., Inc., Malden, Mass.  
Model SW-58, 9-2000 meters, \$129.50, 6 tubes. Model SW-34, 9-2000 meters, \$85.00, 6 tubes. Model SW-3, 9-2000 meters, \$89.50, 3 tubes. Model SW-3, DC model, 9-2000 meters, \$55, 3 tubes. (All metal case)

## PATTERSON

Patterson Radio Co., 1320 So. Los Angeles St., Los Angeles, Cal.  
Mod. 70-AW, \$44.50, Compact, 7 tu. 15-575 m. Mod. 107-AW, \$54.50, Console, 7 tu. 15-575 m. Mod. 207-AW, \$64.50, Console, 7 tu. 15-575 m. Mod. 110-AW, \$69.50, Cons., 10 tu. 15-575 m. Mod. 210-AW, \$79.50, Cons., 10 tu. 15-575 m.

## PHILCO

Philco Radio & Television Corp., Phila., Pa.  
43-X, \$100, Console, 9 tubes, 15-545 meters. 43-H, \$79.95, Hi-Boy, 9 tubes, 15-545 meters. 43-B, \$59.95, Baby Grand, 9 tu. 15-545 meters. 4-C Converter, \$39.50, Compact, 15. 8-200 meters, 2 tubes.

## PHILMORE

Philmore Mfg. Co., 113 University Place, New York, N. Y.  
P-4, \$24.50, Midget, 4 tubes, 75-550 meters  
PD-4 \$24.50, Midget, 5 tubes, 75-550 meters  
P-7 \$52.50, Midget, 7 tubes, 200-2000 meters  
P-6 \$47.50, Midget, 6 tubes, 60-600 meters  
P-8 \$59.00, Midget, 7 tubes, 60-600 meters

## PIERCE AIRO (DeWald)

Pierce Airo, Inc., 510 6th Ave., New York, N. Y. (Prices on request).  
Model BAM, 11 tubes, 15-600 meters.  
Model BAH, 7 tubes, 60-600 meters.  
Model BLG, 7 tubes, 200-2000 meters.

## PILOT

Pilot Radio & Tube Corp., Lawrence, Mass.  
Mod. 1010, \$59.50, Midget, 7 tubes, 18-555 m. Mod. 1011-R, \$64.50, Midget, 7 tu. 18-555 m. Mod. 8810, \$99.50, Console, 7 tu. 18-555 m. Mod. 8811-R, \$104.50, Console, 7 tu. 18-555 m.

## PLAZA MUSIC (Hamilton Lloyd)

10 West 20th St., New York, N. Y.  
Mod. 60, \$49.75, Midget, 6 tu. 200-2000 m.

## REMLER

Remler Co., Ltd., 2101 Bryant St., San Francisco, Cal.

### Mantel Model:

New Model 21-3, \$29.90, 5 tubes, 75-550 met.  
Model 10-3 \$42.75, 6 tubes, 46-550 meters  
Model 15-3 \$59.50, 9 tubes, 46-550 meters

## SENTINEL

Sentinel Radio Corp., 9705 Cottage Grove Ave., Chicago, Ill.  
Mod. 827, \$107.50, Highboy, 8 tu. 15-2000 m. Mod. 826, \$92.50, Console, 8 tu. 15-2000 m. Mod. 614, \$39.90, Midget, 6 tu. 85-550 meters.

## Better Sets Depend on Better Condensers

That's why better grade set manufacturers are depending more and more on those better DUBILIER paper, mica and electrolytic condensers.

### DUBILIER CONDENSER CORPORATION

4377 Bronx Blvd. New York City



### KIT No. 125, shown above

Write for Free Catalog on 75 Other Types in Seven Colors.

### Banks INTER-AIR Products

R-4106 - 50th STREET

WOODSIDE, NEW YORK

## SILVER MARSHALL

Silver-Marshall, Inc., 191 West Madison St., Chicago, Ill.

See full page advertisement on Page 98.

## SIMPLEX

Simplex Radio Co., Sandusky, Ohio.  
Model P \$29.95, Midget, 5 tu. 75-550 meters  
Model P \$29.95, Midget, 5 tu. 75-550 meters  
Model P \$29.95, Midget, 5 tu. 75-550 meters  
Model R \$19.95, Midget, 4 tu. 75-550 meters  
Model R \$19.95, Midget, 4 tu. 75-550 meters  
Model S \$39.95, Midget, 5 tu. 15-2400 meters

## STEWART WARNER

Stewart Warner Corp., 1826 Diversey Parkway, Chicago, Ill.

### Model:

R-44-A, \$83.95, Console, 8 tu. 15-550 meters  
R-46-A, \$96.95, Console, 8 tu. 15-550 meters  
R-48-A, \$167.25, Console, 8 tu. 15-550 meters  
R-50-A, \$157.50, Console, 10 tu. 13-550 meters  
R-51-A, \$194.50, Console, 10 tu. 13-550 meters  
R-58-A, \$270.50, Console, 10 tu. 13-550 meters  
55 \$119.75, 11 tubes, 15-550 meters  
56 \$129.75, 11 tubes, 15-550 meters  
63 \$68.95, 7 tubes, 15-550 meters  
64 \$74.95, 7 tubes, 15-550 meters  
65 \$83.95, 7 tubes, 15-550 meters

## TRANSFORMER CORP. OF AMERICA (Clarion)

Transformer Corp. of America, Ogden and Keeler Aves., Chicago, Ill.

Mod. 240, \$41.95, Midget, 8 tu. 20-550 meters  
Mod. 241, \$41.95, Midget, 8 tu. 200-550 meters

## UNITED AMERICAN BOSCH CORP. (American Bosch)

### Model:

200-A, Police and B'cast, \$49.95, Chest, 5 tu.  
200-B, Police and B'cast, \$49.95, Chest, 5 tu.  
260-C, \$132.95, Console, 9 tubes, 15-550 meters  
260-R, \$105.95, Console, 9 tubes, 15-550 meters

## U. S. RADIO & TELEVISION CORP. (Apex)

Marion, Ind. (3301 South Adams Street).  
Mod. 5-A, Table, \$36.50, 5 tu. 75-550 meters  
Mod. 7-D, Table, \$52.50, 7 tu. 15-550 meters

## WELLS-GARDNER-GULBRANSEN (Wells-Gardner)

The Gulbransen Co., 816 No. Kedzie Ave., Chicago, Ill.

Mod. 2522, \$34.50, Mantel 5 tu. 75-550 meters  
Mod. 2525, \$39.50, Cons., 5 tu. 75-550 meters

## WILCOX-GAY

Wilcox-Gay Corp., Charlotte, Michigan.  
Model 2-T-5-30. Table. \$33.50. 5 tubes, 75-550 meters.

## ZENITH & ZENETTE

Zenith Radio Corp., 3620 Iron St., Chicago, Ill.  
Mod. 250, \$73.00, Table 7 tu. 15-560 meters  
Mod. 260, \$92.00, Lowboy 7 tu. 15-560 meters

# Sylvania Tubes

(Reg. U. S. Pat. Off.)

Make . . .  
Every set  
do its best

# THE RADIO BUYERS' GUIDE

OF  
"RADIO"  
THE NATIONAL TRADE MAGAZINE

JANUARY, 1933

Who Makes It . . . Where to Buy It . . . What It Costs

## PACKARD MANUFACTURING CORPORATION

Manufactured By  
**Packard Manufacturing Corp.**

### ADDRESS

General & Sales Offices,  
Fort Wayne, Indiana  
Factory and Accounting Offices,  
Elyria, Ohio

### OFFICERS OF THE COMPANY

H. E. CAPEHART, President  
J. E. Broyles, Vice-President  
R. G. NORMAN, Secretary

### ADVERTISING AGENCY

Suedhoff & Co., Citizens Trust Bldg.,  
Fort Wayne, Indiana

### NEW YORK OFFICE

J. B. Price, 12 E. 41st Street,  
New York, N. Y.

### EXPORT SALES DEPARTMENT

Roynat Corporation, 47-DZ 5th Ave.,  
Long Island City, N. Y.  
Cable Address—Natvarno—N. Y.

### PACKARD MERCHANDISING POLICY

The "PACKARD" No. 8 RECORD CHANGER is sold direct from the Packard Manufacturing Corp., Fort Wayne, Indiana, to Radio and Phonograph Manufacturers, Public Address System Engineers, Radio and Phonograph Jobbers and Dealers throughout the world. The machine is unusually compact and fool proof, being free from intricate and wearing parts . . . making it ideally suited for every use requiring continuous record reproduction.

H. E. CAPEHART, Pres.

For Discounts and Terms  
Write or Wire to  
Packard Manufacturing Corp.,  
Fort Wayne, Ind.

"PACKARD"

A Symbol of Quality and Simplicity  
In Record Changers

## THE "PACKARD" No. 8

## Record Changer

**\$50** List Price

COMPLETE

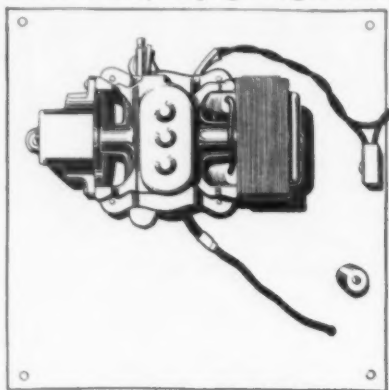
LIBERAL DISCOUNT



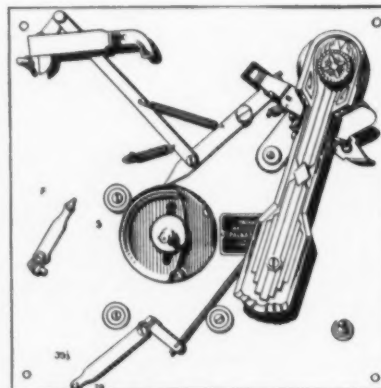
**FULL CHASSIS VIEW**  
(Showing cabinet type mounting)  
Width, 22 1/4 in.; Depth, 13 1/4 in.; Height above mounting board, 3 1/2 in.; Depth below mounting board, 3 in.

### SPECIFICATIONS

All steel construction, heavily copper plated. Statuary Bronze finish. Plays eight ten inch records automatically. Plays 12 inch records manually. Any record may be repeated. Repeats last record. Improved type, two speed motor. Plays standard 78 r.p.m. or 33 1/3 r.p.m. records. Exceptionally simple. Requires small space. Flat type flexible pickup. Volume control. Master switch. Electrical specifications: 110 volt A.C., 60 cycles (odd cycles slightly higher). Comes completely assembled, ready to plug in light socket.



**CHASSIS BOTTOM VIEW**  
Width, 12 in.; Depth, 12 in.; Depth below mounting board, 3 in.



**CHASSIS TOP VIEW**  
(Turntable removed)  
Width, 12 in.; Depth, 12 in.; Height above mounting board, 3 1/2 in.

The "PACKARD" No. 8 RECORD CHANGER in combination with any make of radio completes an ideal music producing arrangement. Due to its compactness it requires only a minimum of space.

### FOR PUBLIC ADDRESS SYSTEMS

Public address system engineers will find the "PACKARD" a boon to their service because of its low initial cost and its freedom from service and attention.

*Sylvania* tubes

"Tested for a . . .  
set like yours"

## ALL AMERICAN MOHAWK CORP. (Lyric)

North Tonawanda, New York.  
Model SA-65—Mantel, \$45.00, 6 tubes.  
Model SA-66—LoBoy, \$53.50, 6 tubes.  
Model SA-90—LoBoy, \$74.50, 9 tubes.  
Model SA-130—Console, \$149.50, 13 tubes.  
Model B-80—LoBoy, \$97.50, 8 tubes.  
Model DC-65—\$47.50, 6 tubes.  
Model DC-65—\$49.50, 6 tubes.

## ANSLEY RADIO LABS (Ansley Universal)

147 West 23rd St., New York, N. Y.  
Model U-8—Portable, \$59.50, 8 tubes.  
Model U-9—Portable, \$79.50, 8 tubes.

## ATWATER-KENT MFG. CO. (Atwater-Kent)

4700 Wissahickon Ave., Philadelphia, Pa.  
Model 812—HiBoy, \$139.50, 12 tubes.  
Model 612—SemiHiBoy, \$116.50, 12 tubes.  
Model 260—SemiHiBoy, \$99.75, 10 tubes.  
Model 469—LoBoy, \$89.75, 9 tubes.  
Model 188—LoBoy, \$73.75, 8 tubes.  
Model 558—Compact, \$63.90, 8 tubes.  
Model 627—Compact, \$53.90, 7 tubes.  
Model 558-D—Compact, \$68.90, 8 tubes.  
Model 469-D—LoBoy, \$89.75, 8 tubes.  
Model 558-Q—Compact, \$68.90, 9 tubes.  
Model 469-Q—LoBoy, \$89.75, 9 tubes.  
Model 91—AutoRadio, \$73.25, 9 tubes.

## AUDIOLA RADIO CO. (Audiola)

430 So. Green St., Chicago, Ill.  
Model 811—Midget, \$49.50, 8 tubes.  
Model 843—LoBoy, \$56.50, 8 tubes.  
Model 868—HiBoy, \$64.50, 8 tubes.  
Model 1011—Midget, \$56.50, 10 tubes.  
Model 1050—LoBoy, \$66.50, 10 tubes.  
Model 1068-N—HiBoy, \$77.50, 10 tubes.  
Model 11300DN—HiBoy, \$109.50, 10 tubes.

## AUTOMATIC RADIO MFG. CO., INC. (Automatic)

112 Canal St., Boston, Mass.  
Model P45—Midget, \$44.50, 6 tubes.  
Model V45—Midget, \$39.50, 6 tubes.  
Model P35—Midget, \$34.50, 5 tubes.  
Model P25—Midget, \$29.50, 4 tubes.

## BELMONT RADIO CORP. (Freshman-Belmont)

520 North Michigan Ave., Chicago, Ill.  
Model 41-A—Midget, \$19.50, 4 tubes.  
Model 51-C—Midget, \$27.95, 4 tubes.  
Model 71-A—Midget, \$39.95, 7 tubes.  
Model 100-A—Console, \$59.95, 10 tubes.  
Model 45—Midget, \$24.50, 4 tubes.  
Model 70-A—AutoRadio, \$69.50, 5 tubes.

## CAPEHART CORP. (Capehart)

Fort Wayne, Indiana.  
Model 1—Phon-Combination, \$169.50, 9 tubes.  
Models 11-12-14, short and best phone combination.  
Prices: \$269.50; \$279.50; \$299.50. All HiBoys. All 10 tubes.  
Model 200—Phon-Combina'n, \$495, HiBoy, 11 tu.  
Model 300—Phon-Combina'n, \$675, HiBoy, 11 tu.  
Model 400A—Phon-Combina'n, \$895, HiBoy, 14 tu.  
Model 402A—Phon-Combina'n, \$875, HiBoy, 14 tu.

## CAWOOD

Cawood Radio Laboratory,  
835 N. Ogden Drive, Los Angeles, Calif.  
Midget, 4 tubes, \$18.75, list; 5 tubes, \$24.75, list.  
TRF. Tradename "SUPERTONE". Also makers of low priced "JALLOPIE". Price on request.

## CENTURY RADIO PROD. CO.

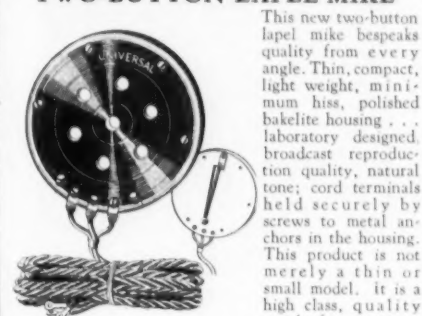
3009 No. Austin Blvd., Chicago, Ill.  
Model 4-47—Mantel, prices on application, 4 tubes.  
Model 5-47—Mantel, prices on application, 5 tubes.  
Model 4-78—Mantel, prices on application, 4 tubes.  
Model 4-47-C—Clock, prices on application, 4 tubes.  
Model 6-55—Mantel, prices on application, 6 tubes.  
Model 5-38—Mantel, prices on application, 5 tubes.  
Model 7-38—AutoRadio, prices on application, 7 tu.

## NEW PROTECTED DIAPHRAGM MODEL X TWO-BUTTON MIKE



Latest X model two-button microphone—acoustically perfect grating now protects the diaphragm—front bar securely fastened maintains center button in constant perfect alignment. Improvements, plus added value of new design and chrome plating, makes this a worthy member of Universal's microphone family—and at no additional cost.

### TWO-BUTTON LAPEL MIKE



\$25.00 List

UNIVERSAL MICROPHONE CO., LTD., Inglewood, Calif.



## PACKARD RECORD CHANGER

BY  
Homer Capehart

MOST SIMPLE -- LOWEST PRICED -- MODERNIZES OBSOLETE MACHINES

PACKARD MFG. CORP., Fort Wayne, Ind.  
H. E. Capehart, Pres.

## HEARN'S

... "Better Radio Service"

Formerly  
Manufacturers Radio Service

ABOX and BALKITE  
ELIMINATOR REPAIRS

ELECTRODES, PARTS, SOLUTIONS

Rebuilt Eliminators and Chargers

1160 Howard St. San Francisco

## COLUMBIA PHONOGRAPH CO., INC. (Columbia)

55 Fifth Ave., New York, N. Y.  
Model C-81—Compact, \$54.50, 8 tubes.  
Model C-83—LoBoy, \$66.00, 8 tubes.  
Model C-84—HiBoy, \$88.00, 8 tubes.  
Model C-85—Phono-Comb. Console, \$108, 8 tubes.  
Model C-103—LoBoy, \$49.50, 7 tubes.  
Model C-93—HiBoy, \$89.50, 10 tubes.  
Model C-95—Console, \$139.00, 10 tubes.

## CORONADO MFG. COMPANY (Coronado)

2233 University Ave., St. Paul, Minn.  
Model Treasure Chest, Midget, \$36.00, 5 tubes.  
Model "Three Star", Midget, \$36.00, 5 tubes.

## CRESCENT RADIO MFG. COMPANY (Crescent)

1026 Second Ave., Minneapolis, Minn.  
Model 32-70—LoBoy, \$88.00, 7 tubes.  
Model M-32—Midget, \$73.00, 7 tubes.  
Model 2-70—LoBoy, \$79.50, 7 tubes.  
Model M-2—Midget, \$59.50, 7 tubes.

## CROSLEY RADIO CORP. (Crosley)

3401 Colerain, Cincinnati, Ohio.  
"The Symphony", 12 tube Super-Het., \$89.50.  
Model 141-2-T—Chest, \$29.95, 5 tubes.  
Model 141-2-GA—Chest, \$34.50, 5 tubes.  
Model "Fiver"—Mantel, \$19.99, 5 tu. Super-Het.  
Model "Sextet"—Mantel, \$34.95, 6 tu. Super-Het.  
Model "Book Case"—Library book case style, \$34.75, 5 tubes, Super-Het.  
Model "Jewel Case"—Chest, \$34.75, 5 tubes, Super-Het.  
Model 129-2-BA—Midget, \$39.95, 6 tubes.  
Model 129-1-2-K—Chest, \$49.95, 6 tubes.  
Model 129-2-L—Console, \$52.00, 6 tubes.  
Model 146-2-E—Midget, \$55.00, 9 tubes.  
Model 146-2-Q—Console, \$65.00, 9 tubes.  
Model 146-1-2-PA—Console, \$75.00, 9 tubes.  
Model 132-1-2-MB—Console, \$99.50, 11 tubes.  
Model 131-1-2-W—Console, \$119.50, 11 tubes.  
Model 96—AutoRadio, \$39.50, 6 tubes.  
Model 128-2-EA—Midget, \$59.95, 8 tubes.  
Model 128-1-LC—Console, \$73.50, 8 tubes.

## CUSTOM BUILT

Custom Built Radio Mfg. Co.,  
4955 Hollywood Blvd., Hollywood, Calif.  
"CROWN" Super T-R-F's. 4 tubes, \$16.95; 5 tubes, \$27.85; 6 tubes, \$34.50. All Midgets. Also a 6 tube TRF Console, \$41.25. All prices are list.

## DAVISON-HAYNES

Davison-Haynes Corp.,  
1730 Venice Blvd., Los Angeles, Calif.  
7 tube super, table model, \$32.50.  
7 tube super, console, \$34.50.  
9 tube super, console, \$46.50.  
All prices are list.

## DUMONT ELECTRIC CORP. (Dumont)

42 West 17th St., New York, N. Y.  
Model 600—Midget, Phono-Comb., \$49.50, 6 tubes.  
Model 400—Midget, \$29.50, 6 tubes.  
Model 503—Midget, \$39.50, 6 tubes.  
Model 904—Chassis, best and long waves, range: 200-2000, \$49.50, 9 tubes.

## ECHOPHONE RADIO MFG. COMPANY, LTD. (Echophone)

104 Lakeview Ave., Waukegan, Ill.  
Model 5—Midget, \$39.75, 6 tubes.  
Model 4—Midget, \$24.75, 4 tubes.  
Model 44—Midget, \$24.75, 4 tubes.  
Model 12—Midget, \$32.75, 5 tubes.  
Model 14—\$46.50, 6 tubes.  
Model 16—\$59.50, 8 tubes.  
Model 17—\$69.50, 8 tubes.  
Model 18—LoBoy, \$89.50, 8 tubes.

## EL-REY RADIO MFG. CO.

8408 So. Broadway, Los Angeles, Calif.  
4 Tube TRF, \$17.95, list.  
6 Tube Super., \$29.95, list.

For

Distance...  
Volume...  
Tone...  
Long Life...

use

Sylvania

SET-TESTED

RADIO TUBES

### EMERSON RADIO PHONO. CORP. (Emerson)

641 6th Ave., New York, N. Y.  
 Universal Compact, 10"x6 1/2"x4 1/4", \$25 complete.  
 Model L-556—Midget, \$29.50, 5 tubes.  
 Model L-557—Compact, \$27.50, 5 tubes.  
 Model L-559—Chest, \$34.50, 5 tubes.  
 Model L-456—Midget, \$29.50, 4 tubes.  
 Model L-457—Compact, \$27.50, 4 tubes.  
 Model L-459—Chest, \$34.50, 4 tubes.  
 Model L-B-458-Baronet—Compact, 4 tubes.  
 Model L-B-460-Baronet—Midget, 4 tubes.  
 (Prices of latter two on application.)

### FADA RADIO & ELECTRIC CORP. (Fada)

Long Island City, New York.  
 Model 73—Table, \$52.00, 7 tubes.  
 Model 85—LoBoy, \$62.50, 7 tubes.  
 Model 74—Console, \$83.50, 9 tubes.  
 Model 76—LoBoy, \$94.00, 9 tubes.  
 Model 87—LoBoy, \$73.00, 9 tubes.  
 Model 78—LoBoy, \$131.00, 11 tubes.  
 Model 79—HiBoy, \$142.00, 11 tubes.  
 Model 83—LoBoy, price on request, 9 tubes.  
 Model 88—LoBoy, price on request, 9 tubes.  
 Model 89—HiBoy, price on request, 9 tubes.  
 Model 93—Table Best and Long Wave, price on request, 7 tubes.  
 Model 95—LoBoy, Best and Long Wave, price on request, 7 tubes.  
 Model 97—LoBoy, \$73.00, 9 tubes.  
 Model 55—Table, \$39.50, 5 tubes.

### FEDERATED PURCHASER (Acratone)

25 Park Place, New York, N. Y.  
 Midgets, from \$14.75 to \$16.25, 5 tubes.  
 Midgets, with best and long waves, 200-2000 meters, from \$18.50 to \$21.50. Phono-Radio Combinations from \$33.50 to \$41.00. Also special 25 cycle models.

### FERGUSON RADIO CORP.

34 East 12th St., New York, N. Y.  
 Model BL-61—Best and Long Wave, Midget, 6 tubes, prices of all above on application.

### Cone Replacements ALL MODELS

With or without Voice Coil Assembly

Largest and Oldest Manufacturer

Attractive Jobber Proposition

United Pressed Products Co.  
 400 W. Erie St., Chicago, Ills.

### DUBILIER ELECTROLYTICS

Available in every type of container, in every size, in any capacity, working voltage and combination, for high-voltage filter and for low-voltage by-pass functions. More capacity for less money—that spells Dubilier Electrolytics!

### DUBILIER CONDENSER CORPORATION

4377 Bronx Blvd. New York City

## EL REY

The King of Modern Radio



Model 30

Superheterodyne Circuit . . . 5 Tubes

Specifications: Automatic Volume Control. Tubes include 1-58, 1-57, 1-55, 1-47 and 1-80. Complete Data Available in Booklet.

### FULLY LICENSED

Under RCA, Hazeltine and Latour Patents.

The entire El Rey line of radio has always proved a consistent seller, not only during the holiday season, but during every month of the year as well.

Every El Rey radio creation represents standard parts and workmanship. All are priced to sell with fair profit to the manufacturer, jobber and retailer.

## EL REY

The King of Modern Radio

El Rey Radio Corporation

8408 So. Broadway Los Angeles, Calif.

### GENERAL ELECTRIC CO. (G.E.)

Bridgeport, Conn.  
 Model J87—Console, 8 tube Super, \$79.50.  
 Model J72—Midget, 7 tube Super, \$47.50.  
 Model J83—Table model, 8 tube Super, \$59.50.  
 Model J107—LoBoy, \$104.50, 10 tubes.  
 Model J125—LoBoy, \$147.50, 12 tubes.  
 Model J105—LoBoy, \$93.50, 10 tubes.  
 Model J86—LoBoy, \$32.95, 8 tubes.  
 Model J100—Table, \$73.75, 10 tubes.  
 Model J82—Table, \$59.50, 8 tubes.  
 Model J85—LoBoy, \$79.50, 8 tubes.  
 Model J75—LoBoy, \$66.50, 7 tubes.  
 Model J80—Table, \$59.95, 7 tubes.  
 Model J70—Table, \$48.75, 7 tubes.  
 Model H91—Grfr. Clock, \$285.00, 9 tubes.  
 Model K82—Grfr. Clock, \$179.00, 9 tubes.  
 Model J109—HiBoy, Phono-Comb., \$269.50, 10 tu.  
 Model J88—LoBoy, Phono-Comb., \$124.75, 8 tubes.  
 Model H72—LoBoy, Phono-Comb., \$345.00, 10 tu.  
 Model S42-B—LoBoy, \$99.50, 8 tubes.  
 Model A-81—Portable, \$81.50, 8 tubes.  
 Model A-90—AutoRadio, \$76.75, 9 tubes.

### GILFILLAN BROS. INC. (Gilfillan)

1818 Venice Blvd., Los Angeles, Calif.  
 Model 5—Midget, \$31.95, 5 tubes.  
 Model 7M—Midget, \$47.50, 7 tubes.  
 Model 7C—Console, \$59.50, 7 tubes.

### GRAYBAR ELEC. CO. (Graybar)

Graybar Bldg., 420 Lexington Ave., N. Y. C.  
 Model GT7—Table, \$46.75, 7 tubes.  
 Model GC13—Console, \$66.50, 7 tubes.  
 Model GT8—Table, \$59.95, 8 tubes.  
 Model GC14—Console, \$79.50, 8 tubes.  
 Model 9—Consolette, price on request, 9 tubes.

### GRIGSBY-GRUNOW (Majestic)

5801 Dickens Ave., Chicago, Ill.  
 Model 311—Table, \$44.50, 7 tubes.  
 Model 291—Table, \$62.50, 9 tubes.  
 Model 314—LoBoy, \$69.50, 7 tubes.  
 Model 293—Console, \$73.00, 9 tubes.  
 Model 307—LoBoy, \$89.50, 10 tubes.  
 Model 304—Console, \$99.50, 10 tubes.  
 Model 324—Console, \$149.50, 11 tubes.

### GULBRANSEN CO. (Gulbransen)

816 North Kedzie Ave., Chicago, Ill.  
 Model 3521—Mantel, police and beat, \$39.50, 5 tubes.  
 Model 3525—Consolette, police & beat, \$49.50, 5 tu.  
 Model 8726—LoBoy, \$69.50, 7 tubes.  
 Model 3225—HiBoy, \$99.50, 12 tubes.  
 Model 3226—Console, \$129.50, 11 tubes.  
 Model 3925—Console, \$74.50, 9 tubes.  
 Model 3622—AutoRadio, \$57.50, 6 tubes.  
 Model 3722—AutoRadio, \$62.50, 7 tubes.

### HALSON RADIO MFG. CORP. (Halsen, Viking, Fanahl-LaSalle)

45-51 Listenard St., New York, N. Y.  
 Model 414S—Midget, \$9.75, 4 tubes.  
 Model 414—Midget, \$10.50, 4 tubes.  
 Model 510—Midget, \$13.50, 5 tubes.  
 Model 615—Midget, \$11.50, 6 tubes.  
 Model 200—Chest, \$13.00, 4 tubes.

### HERBERT H. HORN, INC. (Tiffanytone)

1627 Hill St., Los Angeles, Calif.  
 Models do not show prices. Prices on request.  
 Model 25—Midget, 4 tubes.  
 Model 30—Midget, 5 tubes.  
 Model 29—Midget, 4 tubes.  
 LoBoy Model, 6 tubes.  
 Model 32—Midget, 5 tubes.  
 Model 110—Console, 10 tubes.

### HOWARD RADIO CO. (Howard)

South Haven, Michigan.  
 Model K—Console, \$89.50, 10 tubes.  
 Model L—HiBoy, \$109.50, 11 tubes.  
 Model 500—Console, \$365.00, 15 tubes.  
 Model 501—Console, \$395.00, 15 tubes.  
 Model M—Console, \$139.50, 13 tubes.  
 Model 33—AutoRadio, prices on request, 8 tubes.

End bad tube troubles

*Sylvania*  
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# THE RADIO BUYERS' GUIDE OF "RADIO" (THE NATIONAL TRADE MAGAZINE)

## INSULINE CORP. (I.C.A.)

23 Park Place, New York City.

Model SuperSix—6 tubes.  
Model SuperSeven—7 tubes.  
Model SuperSix—Best. & Long Waves, 6 tubes, 200-2000 meters.  
Model SuperSix—Best. & Long Waves, 6 tubes, 200-2000 meters.  
Model SuperSeven—Best. & Long Waves, 7 tubes, 200-2000 meters.  
Envoyette—Midget, 5 tubes.  
(All prices on application.)  
Universal Companion—Portable, 7 tubes.

## INTERNATIONAL RADIO CORP. (International)

Ann Arbor, Michigan.

Model PW—Midget, \$25.00, 4 tubes.  
Model PM—Midget, \$25.00, 4 tubes.  
Model PB—Midget, \$25.00, 4 tubes.  
Model PD—Midget, \$35.00, 4 tubes.  
All Purpose Model—\$25.00, 4 tubes.

## JACKSON BELL MFG. CO. LTD. (Jackson-Bell)

650 McKinley Ave., Los Angeles, Calif.  
(See Editorial Section)

## JACKSON RADIO & TELEV. CO.

8440 So. Chicago Ave., Chicago, Ill.

Model SF547—Midget, \$23.50, 5 tubes.  
Model LK447—Midget, \$19.75, 4 tubes.

## KELLER-FULLER

Keller-Fuller Mfg. Co., Ltd.,

4957 Sunset Blvd., Los Angeles, Calif.

4 tube TRF, \$14.95, list; 5 tube super het., \$21.95, list; 9 tube super het., \$49.95, list; 12 tube console, super het., \$59.50, list.

## COLIN B. KENNEDY CORP. (Kennedy)

212 West Ewing, South Bend, Ind.

Model 366B—HiBoy, 9 tubes.  
Model 62D—HiBoy, 10 tubes.  
Model 62D—LoBoy, 10 tubes.  
(Prices on application.)

## KOLSTER RADIO, INC. (Kolster)

200 Mt. Pleasant Ave., Newark, N. J.

Models K110 & K112—Mantel, \$61.00, 8 tubes.  
Model K14—Mantel, \$71.25, 9 tubes.  
Models K120, K122—Consoles, \$76.50, 8 tubes.  
Model K113—Mantel, \$66.25, 8 tubes.  
Model K123—Console, \$81.75, 8 tubes.  
Models K130, K132—Consoles, \$102.00, 9 tubes.  
Model K133—Console, \$112.25, 10 tubes.  
Models K140, K142—DeLuxe Consoles, \$148, 10 tu.  
Model K133A—DeLuxe Console, \$139.75, 10 tubes.

## LANG RADIO COMPANY (Lang)

767 East 132nd St., New York City.

Model AA5—Midget, 5 tubes.  
Model DC6—Midget, 6 tubes.  
Model AA7—Midget, 7 tubes.  
Model DB—Midget, 7 tubes.  
(Prices on application.)

## MISSION BELL

Mission Bell Radio Mfg. Co., Inc.,  
1455 Venice Blvd., Los Angeles, Calif.

4 tube super het., \$17.50.  
5 tube super het., \$22.45.

## MANHART

Manhart Radio Co.,  
6219 So. Hoover St., Los Angeles, Calif.

Tradename "ROAMER".  
Super-Het. 6 tube Console, \$32.50, list.  
8 tube Super-Het. Console, \$49.50, list.

## NATIONAL CO., INC. (National)

Malden, Mass.

Model MB-32—Tuner Chassis, \$85.00, 4 tubes.  
Model VSA—Amplifier & pwr. supply, \$68.50, 4 tu.

## PARAMOUNT

Los Angeles Radio Mfg. Co.,  
944 So. Broadway, Los Angeles, Calif.

Auto sets: 4 tube, TRF, list \$18.95; 5 tube, TRF, list \$29.95; 7 tube, super, all electric, list \$79.95.  
All-wave set, 11 tube, super, list \$69.50. Midgets: 4 tube "Kewpie" TRF, list \$16.95; 4 tube "Hollywood" TRF, \$19.95; 4 tube Paramount PeeWee TRF, list \$24.95; 4 tube Paramount de luxe TRF, list \$29.95; 5 tube Paramount TRF, list \$34.50; 7 tube super, list \$44.50; 10 tube super \$59.50; consoles slightly higher.

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## Try-Mo Radio Co., Inc.

Dept. RA1, 85 Cortlandt Street  
NEW YORK, N. Y.

## PATTERSON RADIO CO. (Patterson and Private Label Radios)

1320 Los Angeles St., Los Angeles, Cal.

Model 70—Compact, \$34.50, 7 tubes.  
Model 107—Console, \$44.50, 7 tubes.  
Model 207—Console, \$54.50, 7 tubes.

## PHILCO RADIO & TELEVISION CORP. (Philco)

Philadelphia, Penn.

Model 80-B—Midget, \$18.75, 4 tubes.  
Model 52-L—Console, \$37.50, 4 tubes.  
Model 24L—Console, Phono-Comb., \$75, 7 tubes.  
Model 15-X—Console, \$150.00, 12 tubes.  
Model 91-X—Console, \$100.00, 10 tubes.  
Model 91-D—HiBoy, \$99.75, 10 tubes.  
Model 91-L—LoBoy, \$89.95, 10 tubes.  
Model 91-B—BabyGrand, \$69.50, 10 tubes.  
Model 71-D—HiBoy, \$79.95, 8 tubes.  
Model 71-H—HiBoy, \$69.95, 8 tubes.  
Model 71-L—LoBoy, \$59.95, 8 tubes.  
Model 71-B—Baby Grand, \$49.50, 8 tubes.  
Model 52-C—Compact, \$39.50, 5 tubes.  
Model 52-B—Baby Grand, \$36.50, 5 tubes.  
Model 23-X—Console, Phono-Comb., \$195.00, 10 tu.  
Model 22-L—LoBoy, Phono-Comb., \$129.50, 8 tubes.  
Model 36-D—HiBoy, \$89.50, 7 tubes.  
Model 36-L—LoBoy, \$69.95, 7 tubes.  
Model 36-B—Baby Grand, \$59.95, 7 tubes.  
Model 47-X—Console, \$100.00, 9 tubes.  
Model 47-D—HiBoy, \$89.95, 9 tubes.  
Model 47-B—Baby Grand, \$59.95, 9 tubes.  
(Prices higher in West.)

## PIERCE-AIRO, INC. (De-Wald)

510 6th Ave., New York City.

Model BAC—4 tubes, Midget.  
Model BAG—6 tubes, Midget.  
Model KAD—4 tubes, Midget.  
Model KAF—6 tubes, Midget.  
Model 50—5 tubes, Table.  
Model 533-A—Midget, 5 tubes.  
(Prices on application.)

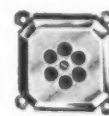
## PILOT RADIO & TUBE CORP. (Pilot)

Lawrence, Mass.

Model Corsair, 9255—Chest, \$39.50, 5 tubes.  
Model Corsair, 9257R—Chest, \$44.50, 5 tubes.  
Model Armada, 8643—Console, \$49.50, 5 tubes.  
Model Armada, 8645R—Console, \$54.50, 5 tubes.  
Model 20th Century, 3679—Midget, \$44.50, 7 tubes.  
Model 20th Century, 7641R—Midget, \$49.50, 7 tubes.  
Model Golden Arrow, 8239—Console, \$67.50, 7 tubes.  
Model Golden Arrow, 8241R—Cons., \$72.50, 7 tubes.

## MILES REPRODUCER COMPANY, INC.

244 West 23rd Street, New York, N. Y.



### New Professional 2 Button Mike

#288, List \$9.00 #291, List \$12.50

Horn Units and Trumpets.  
Heavy Micromatic Types up to \$275.00.  
Also over 100 other Public Address parts.

Type	#280	1 Button	List \$ 1.50
	281	1 Button	List 3.00
	282	1 Button	List 5.00
	283	2 Button	List 6.50
	284	2 Button	List 7.50
	285	2 Button	List 10.00

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**PIONEER PRODUCTS (Pioneer)**  
Plano, Ill.

Model S33-M—Midget, \$84.25, 7 tubes, batt. model.  
Model S33-C—Console, \$98.75, 7 tubes, batt. model.  
Model T33-M—Midget, \$75.35, 6 tubes, batt. model.  
Model T33-C—Console, \$88.60, 6 tubes, batt. model.  
(All with batteries. Tax to be added.)

**PLAZA MUSIC COMPANY**  
(Hamilton-Lloyd)

10 West 20th St., New York, N. Y.

Model 711—Midget, \$32.75, 5 tubes.  
Model 711—Midget, \$30.50, 5 tubes.  
Model Pal-61—Portable, \$32.50, 5 tubes.  
Model Pal-59—Portable, \$30.25, 5 tubes.  
Model 16—Midget, \$41.00, 7 tubes.  
Model 90—Midget, 6 tubes.  
Model 52—Console, \$49.75, 6 tubes.  
Model 134—Console, Phono-Comb., data on request.

**RADIART CORP. (Radiart)**

13229 Shaw Ave., Cleveland, Ohio.

Model 41A—Midget, \$22.50, 4 tubes.  
Model 52A—Midget, \$32.50, 5 tubes.

**RADIO CHASSIS, INC.**

110 West 18th St., New York, N. Y.

Model SUA36—Midget, \$37.50, 6 tubes.  
Model FVA35—Midget, \$21.00, 5 tubes.  
Model AC25—Midget, \$27.50, 4 tubes.  
Model FVD36—Midget, \$34.50, 6 tubes.  
Model DC25—Midget, \$29.50, 5 tubes.  
Model CH38—Chassis price on request, 8 tubes.  
Model TR36—Chest, \$39.50, 6 tubes.  
Model TR35—Chest, \$38.50, 5 tubes.

**R.C.A. VICTOR CO., INC.**  
(RCA-Victor)

Camden, N. J.

Model R4—Midget, \$48.75, 7 tubes.  
Model R71-73—Table, \$59.50, 8 tubes.  
Model R72-75—Console, \$72.95, 8 tubes.  
Model R74—Table, \$73.75, 10 tubes.  
Model R76—Console, \$93.50, 10 tubes.  
Model R77—Console, \$104.50, 10 tubes.  
Model R78—Console, \$149.75, 12 tubes.  
Model RAE84—Console, automatic phono-comb., \$310.00, 12 tubes.  
Model R81—Console, \$178.00, 10 tubes.  
Model R6—Console, \$66.50, 7 tubes.  
Model R71B—Table, \$62.75, 8 tubes.  
Model 80-70, \$125.00.

**REMLER CO., LTD.**

(See Short-BCST. Wave Section)

**J & L SARA CO., INC. (Sara)**

123 Liberty St., New York City.

Model SJ4K—Chassis, \$43.75, 5 tubes.

**SENTINEL RADIO CORP.**  
(Sentinel)

9705 Cottage Grove Ave., Chicago, Ill.

Midget 4 Tube Superheterodyne. Dynamic Speaker, \$22.50.

**SILVER—(McMurdo Silver, Inc.)**  
Chicago, Ill.

3 Super-Heterodynes. Broadcast and Police Bands. Specifications and prices on application. Complete details in next issue.

**SPARKS WITHINGTON CO.**  
(Sparton)

Jackson, Mich.

Model 14—LoBoy, \$71.25, 8 tubes.  
Model 18—HiBoy, \$99.50, 10 tubes.  
Model 27A—HiBoy, \$142.75, 13 tubes.  
Model 28—HiBoy, \$168.75, 13 tubes.  
Model 34—HiBoy—Automatic, \$71.25, 7 tubes.  
Model 30—HiBoy, Phono-Comb., \$198.50, 10 tu.  
Model 30A—HiBoy, Phono-Comb., \$238.75, 10 tu.

**STEWART-WARNER CORP.**

1826 Diversey Parkway, Chicago, Ill.

Model R40A—Mantel, \$52.45, 6 tubes.  
Model R43A—Console, \$67.45, 6 tubes.  
Model R45A—Console, \$79.95, 6 tubes.  
Model R47A—Portable Console, \$81.95, 6 tubes.  
(See Short Wave section for other models.)

**STROMBERG-CARLSON TEL. MFG. CO. (Stromberg-Carlson)**

110 Carlson Road, Rochester, N. Y.

Model 37—Console, \$143.00, 9 tubes.  
Model 38—Console, \$172.50, 8 tubes.  
Model 39—Console, \$195.00, 8 tubes.  
Model 40—Console, \$232.50, 8 tubes.  
Model 41—Console, Automat. Phono-Comb., \$407.50, 8 tubes.  
Model 27—Console Remote Control, \$310, 9 tubes.  
Model 22—Console Remote Control, \$385, 10 tubes.  
Model 24—Console Remote Control, \$567.50, 10 tu.  
(Prices higher west of Rockies.)

**L. TATRO PRODUCTS CORP.**  
(Tatro)

Decorah, Iowa.

(These models are all for 32-volt operation.)

Model C932—LoBoy, 9 tubes.  
Model F923—LoBoy, 9 tubes.  
Model F913—LoBoy, 9 tubes.  
Model E83—LoBoy, 8 tubes.  
Model E73—LoBoy, 7 tubes.  
Model D70—Table, 7 tubes.  
(Prices on request.)

**TRANSFORMER CORP. OF AMERICA (Clarion)**

Ogden and Keeler Aves., Chicago, Ill.

Model 220—Midget, \$31.95, 6 tubes.  
Model 260—LoBoy, \$52.95, 10 tubes.  
Model 260C—Chassis, \$41.95, 10 tubes.  
Model 280—Console, \$73.95, 12 tubes.  
Model 300—Console, \$129.50, 14 tubes.

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Homer Caphart  
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FORT WAYNE, IND.

**TROJAC FACTORIES**

5862 South Hoover, St., Los Angeles

4 tube TRF, \$17.90.  
4 tube TRF Tom Thumb Model, \$19.90.  
5 tube TRF, \$29.90.  
4 tube coffee table model, \$39.90.  
5 tube coffee table model, \$41.90.

**TRAVLER-RADIO & TELEVISION CORP. (Trav-ler)**

1818 Washington Ave., St. Louis, Mo.

Model Mantel—\$59.50, 9 tubes.

**UNITED AMERICAN BOSCH CORP. (American Bosch)**

Springfield, Mass.

Model 205A—Personal, \$34.95, 5 tubes.  
Model 236A—Personal, \$45.95, 6 tubes.  
Model 224D—Console, \$84.95, 7 tubes.  
Model 226F—Console, \$99.95, 8 tubes.  
Model 242E—Console, \$69.95, 8 tubes.  
Model 250M—Console, \$95.95, 10 tubes.  
Model 312C—Console, \$147.95, 12 tubes.  
Model 312G—Console, \$178.95, 12 tubes.  
Model 100—AutoRadio, \$59.95, 7 tubes.

**U. S. RADIO & TELEVISION CORP. (Apex & Gloritone)**

3301 South Adams St., Marion, Ind.

Model 25A—Table, \$33.50, 5 tubes.  
Model 9A—Table, \$52.50, 9 tubes.  
Model 9B—LoBoy, \$63.50, 9 tubes.  
Model 19B—LoBoy, \$75.00, 9 tubes.  
Model 12B—HiBoy, \$107.50, 12 tubes.  
Model 120B—HiBoy, \$150.00, 12 tubes.  
Model 24—Midget, \$17.95, 4 tubes.

**WELLS GARDNER GULBRANSEN (Wells-Gardner)**

816 No. Kedzie Ave., Chicago, Ill.

Model 7721—Mantel, \$49.50, 7 tubes.  
Model 7725—LoBoy, \$69.50, 6 tubes.  
Model 9027—Console, \$79.50, 10 tubes.  
Model 2225—Console, \$94.50, 12 tubes.  
Model 926—Console, \$49.50, 5 tubes.  
Model 2925—Console, \$72.50, 9 tubes.  
Model 1622—AutoRadio, \$57.50, 6 tubes.

**WESTONE**

Westone Radio Mfg. Co.,

2513 So. La Salle Ave., Los Angeles, Calif.

4 tube TRF; 4 tube TRF cabinet model; 5 tube TRF De-Luxe. All prices on request.

**WILLARD**

Manufactured by Gillfillan Bros.,

1815 Venice Blvd., Los Angeles.

Model A 4 tube TRF.  
Model C 4 tube TRF de luxe.  
Model G 4 tube super.  
Model D 5 tube super.  
Model F 5 tube super de luxe.

**WILCO (Wilco Mfg. Co.)**

1477 West Adams St., Los Angeles

4 tube TRF, 4 tube super, 5 tube super. Prices on request.

**WONDER BAR RADIO CO.**  
(Wonder-Bar)

6-10 Great Jones St., New York City, N. Y.

Model 61—Refreshment Bar & Radio, \$149.50, 5 tu.  
Model 46—\$149.50, 6 tubes.

**ZENITH RADIO CORPORATION**

3620 Iron St., Chicago, Ill.

Model 210—Table, \$49.95, 7 tubes.  
Model 210-5—Table, Best. & Long Wave, \$55.00, 171-2100 meters, 7 tubes.  
Short bat. wave set—See other section of magazine.  
Model 230—Table, \$55.25, 8 tubes.  
Model 240—LoBoy, \$78.75, 8 tubes.  
Model 245—LoBoy, \$102.50, 8 tubes.  
Model 270—LoBoy, Phono-Comb., \$123.50, 7 tubes.  
Model 410—LoBoy, \$105.00, 10 tubes.  
Model 411—LoBoy, \$124.00, 10 tubes.  
Model 420—LoBoy, \$145.00, 10 tubes.  
Model 430—Semi-HiBoy, \$166.00, 12 tubes.  
Model 440—Semi-HiBoy, \$184.00, 12 tubes.  
Model 220—LoBoy, \$62.50, 7 tubes.

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# THE RADIO BUYERS' GUIDE

OF  
"RADIO"

JANUARY, 1933

THE NATIONAL TRADE MAGAZINE

Who Makes It . . . Where to Buy It . . . What It Costs

## AUTO RADIO SETS

### ATWATER-KENT

Atwater-Kent Mfg. Co.  
4700 Wissahickon Ave., Philadelphia, Pa.  
AUTORADIO, Model 91, \$73.25, 150-550 meters.  
9 tubes: 3 36's; 4 37's; 2 38's.

### BELMONT (Freshman-Belmont)

Belmont Radio Corp.  
520 North Michigan Ave., Chicago, Ill.  
AUTORADIO, Model 70-B, \$69.50, 200-550 meters.  
6 tubes, including rectifier tube in B Eliminator, which is built into set.  
Tubes: 2 36's; 1 37; 2 39's.  
Wave range: 200-550 meters.

### CENTURY

Century Radio Products Co.  
3009 No. Austin Blvd., Chicago, Ill.  
AUTORADIO, Model 7-38. Price on application.  
7 tubes: 3 39's; 2 37's; 2 38's.  
Wave range: 200-550 meters.

### CROSLEY

Crosley Radio Corporation  
Cincinnati, Ohio.  
AUTORADIO, Model 96, \$39.50.  
6 tubes: 3 39's; 1 36; 1 85; 1 89.  
Wave range: 195-550 meters.

### ELECTRIC AUTO-LITE

Electric Auto Lite Co.  
Toledo, Ohio.  
AUTORADIO, Model 3722, \$89.50, including B eliminator.  
7 tubes: 3 39's; 1 36; 1 37; 2 41's.  
Wave range: 200-550 meters.

### EL REY

El Rey Radio Mfg. Co.  
8406 So. Broadway, Los Angeles, Calif.  
AUTORADIO, Model "CarSet", \$49.50, with remote control.  
6 tubes: 3 39's; 1 36; 1 37; 1 41.  
Wave range: 150-550 meters.  
4 tube AutoRadio, \$24.50, list.

### FLEETWOOD

Fleetwood Radio Corporation.  
Fleetwood, Pennsylvania.  
AUTORADIO, Model GF-106, price on application.  
6 tubes: 3 39's; 1 36; 1 37; 1 41.  
Wave range: 200-550 meters.

### FRANKLIN

Franklin Radio Corp.  
333 Linden Ave., Dayton, Ohio  
AUTORADIO, Model 100, price on application.  
6 tubes: 3 36's; 1 37; 2 38's.  
Wave range: 200-550 meters. Also special models.

### GALVIN (Motorola)

Galvin Manufacturing Corp.  
847 West Harrison St., Chicago, Ill.  
AUTORADIO, Model 88, \$74.95, with inbuilt B elim.  
8 tubes: 2 36's; 2 38's; 1 39; 1 85; 1 Rect.  
Wave range: 200-550 meters.  
AUTORADIO, Model 61, \$59.50, with inbuilt B elim.  
6 tubes: 2 36's; 1 39; 1 41; 1 85; 1 Rect.  
Wave range: 200-550 meters.

### GENERAL ELECTRIC (G.E.)

AUTORADIO, Model A-90, \$76.75, battery operated.  
9 tubes: 3 36's; 4 37's; 2 112-A's.  
Wave range: 200-550 meters.  
Model A-60, 6 tube, Super-Het. Low priced auto set. Prices on request.

### GRIGSBY GRUNOW (Majestic)

Grigsby-Grunow Co., 5801 Dickens Ave., Chicago, Ill.  
AUTORADIO, \$49.50, list, complete.  
7 tubes: 3 36's, 2 37's, 2 38's.  
Also makers of the newly announced auto radio for Ford.

### HOWARD

Howard Radio Co., South Haven, Michigan.  
AUTORADIO, Model 33, price on application.  
8 tubes: 4 44's; 1 37; 1 69; 2 41's.  
Wave range: 150-550 meters.

### JACKSON-BELL

Jackson-Bell Mfg. Co., Ltd.  
6500 McKinley Ave., Los Angeles, Calif.  
AUTORADIO, Model 205, \$39.95.  
5 tubes: 2 58's; 1 57; 1 55; 1 47.  
Wave range: 200-550 meters.

### J.M.P. (Auto Dial)

J.M.P. Mfg., Inc., Milwaukee, Wis.  
AUTORADIO, Model 42, \$40.00.  
5 tubes: 2 24's; 1 27; 1 35; 1 47.  
Wave range: 200-550 meters.

### KELLER-FULLER

Keller-Fuller Mfg. Co., Ltd.,  
4957 Sunset Blvd., Los Angeles, Calif.  
AUTORADIO, 9 tube Super-Het., with "B" Eliminator, \$80.00, list.

### KARADIO

Karadio Corp.  
1619 Hennepin Ave., Minneapolis, Minn.  
AUTORADIO, Model 9, \$86.50.  
9 tubes: 3 36's; 3 37's; 3 71's.  
Wave range: Standard or special.  
AUTORADIO, Model 11, \$112.50, inbuilt B elim.  
11 tubes: 4 36's; 3 37's; 4 71's.  
Wave range: Standard or special.

### L. A. RADIO CO. (Paramount)

Los Angeles Radio Co., 944 South Broadway, Los Angeles, Calif.  
7 tube super, \$49.95 list.

### MISSION BELL

Mission Bell Mfg. Co., Inc.  
1455 Venice Blvd., Los Angeles, Cal.  
6 tube Super-Het. Auto-House Combination, \$49.50, list. 6 tube Super-Heterodyne all-electric, \$59.50, list. AUTO-B Eliminator, \$18.50, list.  
Wave range: 175-550 meters.

### NORTHWEST SPECIALTY (Walton)

Northwest Specialty Service, Ltd., Waukegan, Ill.  
AUTORADIO, Model M, price on application.  
6 tubes: 2 39's; 1 36; 1 37; 2 38's.  
Wave range: 175-550 meters.

### PHILCO (Transitone)

Philco Radio & Television Corp.  
Ontario and C Sts., Philadelphia, Pa.  
AUTORADIO, 3 models.  
\$69.50 model has 5 tubes: 3 36's, 1 38, 1 41.  
\$79.50 model has same tubes but is supplied with B Eliminator.  
\$94.50 model has 6 tubes: 2 41's, 1 38, 3 36's. B Eliminator included with this model.

### ROAMER

Manhart Radio Co.,  
6219 So. Hoover St., Los Angeles, Calif.  
AUTORADIO, 4, 6 and 8 tube sets, \$24.50, \$39.50 and \$69.50, list.

### RCA-VICTOR

RCA-Victor Co., Inc., Camden, N. J.  
AUTORADIO, Model M-30, \$76.75.  
9 tubes: 3 36's; 4 37's; 2 112-A's.  
Wave range: 200-550 meters.

### SENTINEL

Sentinel Radio Corp.  
9705 Cottage Grove Ave., Chicago, Ill.  
AUTORADIO, Model 521, \$39.50.  
5 tubes: 1 36; 2 39's; 1 41; 1 85.  
Wave range: 200-550 meters.

### SPARTON

Sparks-Withington Co.  
Jackson, Michigan.  
AUTORADIO, Model 34, \$71.25.  
7 tubes: 2 38's; 2 39's; 1 36; 1 37; 1 70.  
Wave range: 200-560 meters.

### UNITED AMERICAN BOSCH (American Bosch)

United American Bosch Corp.  
Springfield, Mass.  
AUTORADIO, Model 100, \$59.95.  
7 tubes: 3 36's; 1 37; 3 38's.  
Wave range: 200-550 meters.

### UNITED MOTORS

3044 West Grand Blvd., Detroit, Mich.  
6 tube Super., \$49.50. "B" Eliminator \$12.00 additional.

### UNIVERSAL

Universal Auto Radio Corp.  
1223 So. Michigan Ave., Chicago, Ill.  
AUTORADIO, Model 77, \$69.50.  
7 tubes: 1 Wund; 2 44's; 2 41's; 1 37; 1 39.  
Wave range: 200-550 meters.  
AUTORADIO, Model 70, \$69.50.  
7 tubes: 3 36's; 2 37's; 2 38's.  
Wave range: 200-550 meters.  
AUTORADIO, Model 57, \$49.50.  
5 tubes: 1 Wund; 2 44's; 1 39; 1 41.  
Wave range: 200-550 meters.

### WELLS-GARDNER

Gulbransen, Wells-Gardner, Division of,  
816 No. Kedzie Ave., Chicago, Ill.  
AUTORADIO, Model 1622, \$57.50, with B elim.  
6 tubes: 3 39's; 1 36; 1 37; 1 41.  
Wave range: 200-550 meters.

For

Distance . . .  
Volume . . .  
Tone . . .  
Long Life . . .

use

*Sylvania*

SET-TESTED

RADIO TUBES

# THE RADIO BUYERS' GUIDE

OF  
"RADIO"  
(THE NATIONAL TRADE MAGAZINE)

JANUARY, 1933

Who Makes It . . . Where to Buy It . . . What It Costs

## PIONEER

### PIONEER PRODUCTS CO.

Not Inc.

### PIONEER RECEIVERS

PIONEER SLOGAN: "Always First".  
The PIONEER Line is manufactured by  
Pioneer Products Company, Not Inc.,  
Plano, Illinois. Cable address: Pionprod-  
co. Codes used: Benteleys; Western Union.

### OFFICERS OF THE COMPANY:

President—G. L. Leitch  
Secretary—H. S. Billingham  
Sales Manager—J. R. Ringeisen  
Chief Engineer—Harold Eisenberg

### BRANCH OFFICES and WAREHOUSE STOCKS:

No Branch Offices are operated at the  
present time, but Warehouse facilities are  
maintained at 1420 Cherry Street, Kansas  
City, Mo., for convenience of Dealers in  
that territory.

### SALES POLICY:

PIONEER RECEIVERS are manufactured  
and sold direct to Dealers, and are licensed  
only for Radio Amateur, Experimental and  
Broadcast Reception under Hazeltine Cor-  
poration and Latour Corporation patents.  
Standard trade discounts approximating  
40% from List Prices are extended to rec-  
ognized Dealers. The current PIONEER  
Line consists of four improved Battery-  
operated Models, herein briefly described.  
Further, and more complete, details cheer-  
fully furnished on request.

### EXPORT SHIPMENTS:

All export inquiries and correspondence  
should be addressed to the company. When  
explicit shipping schedules and instruc-  
tions are received, they will be followed  
explicitly, otherwise our regular, efficient  
forwarding agents will handle.

### PIONEER ACCESSORIES and PARTS, SHOWING DEALERS NET PRICES:

These parts sold only for use in PIONEER  
Receivers and may be obtained only from  
PIONEER Sales Offices.

#### Cabinet furniture:

Consoles, C-33 & C-60.....13.56\*  
Mantel-type, M-33 & M-60..... 4.86\*

#### Chassis:

T.R.F. Model 60..... 15.96\*  
Superheterodyne Model 33..... 20.61\*

#### Speakers:

Wright-DeCoster, for Consoles.. 4.23\*  
Best Mfg. Co. for Midgets..... 4.23\*

#### Tube Complements, matched sets:

For T.R.F. Model 60..... 8.52  
For Super Model 33..... 9.21

#### Battery Accessories:

Eveready Air-Cell "A" Battery.. 5.95  
Two Volt Storage "A" Battery.... 5.15  
Four Dry-Cells for "A" Supply.. 1.20  
Three 45 V Heavy Duty "B" Bat. 4.95  
Three 4½ V "C" Batteries..... 1.05

#### Condensers:

Dual\* 4 Electrolytic..... .65

#### Variable Condensers:

3 gang DeJur-Amsco..... 2.10

#### R. F. Coils, 3 gang:

Single ..... .75  
Coil Shields ..... .15

#### I. F. Coils, 3 gang:

Single ..... 1.10

\* Items take 5% additional for Government  
Excise Tax. All sales F.O.B. Plano, Ill., or  
Kansas City, Mo.

### THE COMPLETE PIONEER LINE



Model No. 33-C, seven tubes, complete  
with Sylvania Tubes, Less Batteries, List  
Price .....\$79.35

Model No. 33-M, (not illustrated) Mantel-  
type Superheterodyne Seven-tube receiver,  
complete with Sylvania Tubes, less Bat-  
teries, List Price .....\$64.85

Model C-60 (not illustrated) T.R.F. Six-  
tube Console Receiver, complete with  
Sylvania Tubes, Less Batteries, List  
Price .....\$69.20

Model M-60 (not illustrated) Mantel-type  
Six-tube T.R.F. Receiver, complete with  
Sylvania Tubes, Less Batteries, List  
Price .....\$55.95

Government Excise Tax included in all  
prices covering Models listed on this page.

### TECHNICAL DATA

Two Modern Battery Operated  
Superheterodynes!—Latest 1933 Models

FIRST AGAIN Pioneer Radio Offers  
Exclusively These NEW Features  
All of Them Innovations in Battery Operated  
Receivers

DIODE DETECTOR AND AUTOMATIC  
VOLUME CONTROL combined in one tube in-  
sures faithful reproduction and prevents blast-  
ing on powerful stations. Materially reduces  
fading and greatly eliminates in-between-station  
noises and static.

PRE-SELECTOR AND BAND-PASS FILTER  
(Previously something found only in exceed-  
ingly high-priced custom built battery radios).  
Insures ten kilocycle selectivity.

NEW SUPERHETERODYNE CIRCUIT—  
Latest type 175 kilocycle intermediate fre-  
quency with separate oscillator.

TWO NEW 34 VARIABLE MU R. F. PEN-  
TODE TUBES used in the circuit insures high  
gain and stable amplification.

IMPROVED 33 OUT-PUT PENTODE TUBE  
—This new tube gives high quality output and  
enough volume to satisfy the most critical.

-tone Compensation—The Audio System  
of this new set has been developed along the  
latest lines. Heretofore it has been impossible  
to secure the deep bass tones at low volume.  
The so-called "Tone control" at its best, has al-  
ways been a make-shift. With our new 1933  
Superheterodyne set, as the volume is lowered,  
the bass notes are automatically accentuated,  
holding as perfect a balance as with full vol-  
ume.

THOROUGHLY SHIELDED—To prevent any  
inter-action between circuits.

HIGH GRADE MATERIALS—All high grade  
materials of standard manufacture are used  
throughout. Actual cost of materials used is  
more than the average all-electric set of same  
specifications. Subject to constant checking  
and inspection throughout manufacturing pro-  
cess.

LOW BATTERY DRAIN—Consider the enor-  
mous power out-put with this small amount of  
in-put.

"A" Battery drain.....62 Amp.  
"B" Battery drain—24 to 30 Mills, de-  
pending upon modulation.

for Quality Sets

*Sylvania*

SET-  
TESTED

tubes

Nationally Advertised

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## INTERNATIONAL RADIO CORPORATION

### INTERNATIONAL SLOGAN

"The Gift of the Year"

The International Line is Manufactured by  
INTERNATIONAL RADIO  
CORPORATION,  
4th and William Streets,  
Ann Arbor, Michigan.

### OFFICERS OF THE COMPANY

President—C. A. Verschoor  
Vice-Pres. & Gen. Mgr.—John Bradfield  
General Sales Mgr.—W. Keene Jackson  
Chief Engineer—Robert P. Wuerfel  
Purchasing Agent—O. DeL. Underwood  
Advertising Agency—MacManus, Inc.,  
Fisher Bldg., Detroit, Michigan.

### SALES POLICY

All International radio products are sold through jobbers to the dealer trade. Not sold direct to dealers but have provided an organization of 156 jobbers covering all distributing points in the country. Replacement parts can be secured from any jobber, but the factory undertakes to repair any Kadette radio mailed to factory by the set owner for a nominal charge of \$1.00. This guarantee is for a period of one year and the set is delivered to the customer in a mailing carton, making it possible to return the set in case of necessity through parcel post. This service policy makes it possible for other than radio dealers to handle the product.

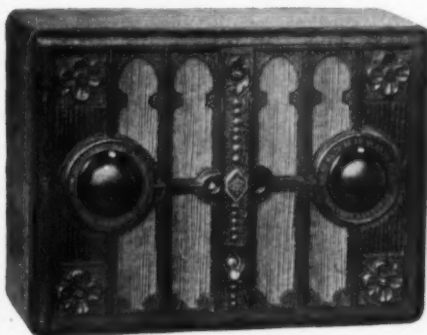
### EXPORT SHIPMENTS

All export business is handled direct from the factory at Ann Arbor, Michigan. Kadette Model "P" is made in an export model to cover from 200 to 2000 meters.

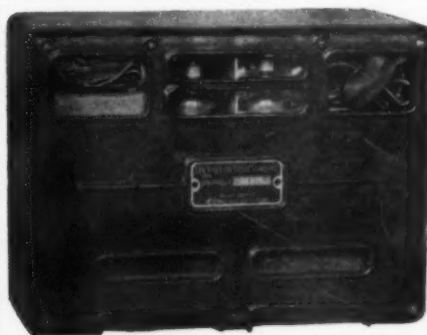
### TECHNICAL DESCRIPTION

Four tube T.R.F. highly sensitive circuit, selects automatically 25 or 60 cycle—110 volt, AC or DC current (cannot burn out). Operates without outside antenna; tunes entire broadcast band; 6" Utah speaker, giving excellent tone quality; chassis of aluminum—most compact, sturdy construction combined with light weight—fully shielded. Antenna furnished in special compartment in the back of the set. New tubes used are 1—KR1, mercury vapor, 1—336 Screen Grid, 1—338 Pentode, 1—339 R. F. Variable Mu Pentode. Highest quality precision product. Shipped complete with tubes. Requires no servicing or installation—just plug-in and tune. Distances up to 500 miles when used on regular antenna.

### THE KADETTE



FRONT VIEW



REAR VIEW



Complete with Tubes and Antenna  
List \$25.00  
Size 8½" Long, 6¼" High, 3¾" Deep,  
Weight About 5 lbs. Net

The cabinets are genuine bakelite with recessed ornamental panels, giving great strength with light weight. Furnished in beautiful permanent finishes (will not scratch). Standard colors—Black, Walnut, Mahogany and a Deluxe model in delicate pastel shades. All standard color sets list at \$25.00—Deluxe model lists at \$35.00—Carrying Case lists \$1.50.

### Entirely New Basic Principle

This revolutionary radio design operates on an entirely new basic principle upon which many Patent applications have been filed.

This new circuit using two pentode tubes provides far greater efficiency than previously considered possible, and allows the use of parts which are so small and light that a radio which actually combines the features of a Direct Current set, and A.C. set and a 25 to 60 cycle set, can be built in the smallest space ever used for even any one single set. This is not only the most compact and lightest weight set but also this is the first commercial radio ever offered in a genuine bakelite cabinet with color selections.

Is offered as an all-purpose Radio for use in the home, office and travel. It operates without adjustment from any 110-volt lamp socket in this country, including 25 to 60 cycle Alternating Current and Direct Current.

Its beauty and compactness find many places in the home where a small personal set is required—in the bedroom, children's room, guest-room or study. This set is ideal for office use as it will fit into the top drawer of a desk or blends in with the desk furnishings. The AC-DC feature is particularly useful for the office, as well as apartment and hotel use. So compact that it takes no more room in a traveling bag than a book. Operates on steamships, in the camp, or wherever 110 volts of any kind is available.

### Pacific Coast Jobbing Stocks

#### CALIFORNIA

##### Fresno

Chanalor & Lyon Stores, Inc.  
1261 Van Ness Avenue.  
McKesson-Langley-Michaels Co.

##### Bakersfield

Chanalor & Lyon Stores, Inc.  
1016 - 18th St.

##### Los Angeles

Chanalor & Lyon Stores, Inc.  
Grand Avenue at 15th St.  
McKesson Western Wholesale Drug Co.

##### Oakland

Chanalor & Lyon Stores, Inc.  
29th and Webster St.  
McKesson-Langley-Michaels Co.

##### Sacramento

Chanalor & Lyon Stores, Inc.  
915 12th St.  
McKesson-Kirk-Geary Company

##### San Francisco

Chanalor & Lyon Stores, Inc.  
730 Polk St.  
McKesson-Langley-Michaels Co.

#### MONTANA

##### Billings

McKesson-Mid-West Drug Co.

#### OREGON

##### Portland

McKesson-Pacific Wholesale Drug Co.

#### UTAH

##### Ogden

McKesson-Ogden Wholesale Drug Co.

#### WASHINGTON

##### Seattle

McKesson-Stewart-Holmes Drug Co.

##### Spokane

McKesson-Spokane Drug Co.

For

Distance . . .  
Volume . . .  
Tone . . .  
Long Life . . .

use

*Sylvania*

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## DUBILIER

Dubilier Condensers Are Manufactured By Dubilier Condenser Corp.

4377 Bronx Boulevard, New York City, N. Y.



### DUBILIER HI-MIKE ELECTROLYTE CONDENSERS

The most advanced form of semi-dry electrolytic condenser in handy aluminum can container, available in wide range of capacities and combinations as standard stock. Can sizes vary in diameter and in height as indicated by drawings and case dimension figures. Two designs are offered—the upright mounting and the inverted standard mounting. Prices include mounting ring in the case of the upright mounting units. Maximum D.C. working voltage: 500.

Priced from 75c to \$5.75



Priced from  
35c up.

All Sizes.

Very wide  
Assortment.



Available in many capacities and working voltages, in non-inductive and inductive windings. Dimensions stated are section sizes. Protective black coating approximately 1/16 inch thick. Six-inch wire leads. Special sections made on order in reasonable quantities at same prices, but with slightly longer delivery.



### HI-MIKE CARDBOARD CONTAINER UNITS

For maximum economy in electrolytic condensers. These all-dry electrolytic condensers available in single and multiple section units, placed in sturdy, impregnated cardboard containers. Available either with wire leads or Dubilier patented terminal lugs at the same list price. Also furnished with mounting flange for horizontal installation, as illustrated. All multiple units in cardboard container have a negative common. When different arrangement of polarity or separate terminals are required, it might be necessary in many cases to increase the size of container.

Priced from 65c to \$5.25

### High Voltage Electrolytic Transmitting Condensers



1 MFD., 1000 to 5000  
Volts, \$2.50 and up.

### Dry "A" Electrolytic Units

For A - Eliminators, low-voltage rectifier circuits supplying radio or signaling systems, and for the hum-proof operation of dynamic speakers for theatre or auditorium purposes, the Dubilier Dry "A" Electrolytics are superior to any other type now on the market. The extreme capacity with relation to the size is amazing. Recommended for unidirectional or direct-current applications, up to 15 and even 25 volts, where extreme capacity is required. For higher working voltages, two or more units may be connected in series. Available in any capacity and D.C. working voltages up to 500, on special order. \$2.75, up.



### TUBULAR CARTRIDGE TYPE

A compact, low priced, all-dry electrolytic unit in paper cartridge container similar in size and appearance to our No. 706 cartridge type paper condensers. The size and convenience of assembly of these very small dimension yet high capacity units, make them especially desirable for by-pass functions in receiver and amplifier assemblies where space is at a premium. Pigtail leads.



Priced from 45c to 60c

### FLAT MOUNTING CONDENSERS

Flat mounting metal can units. Bright finish can. Side terminals. Compact dimensions.

Types 856 and 857

Priced from 45c to 55c



### Cardboard Box Type



Where price is the main consideration, the Cardboard Box Type Lo-Volt Electrolytics are recommended. All-dry design. Sturdy cardboard container, thoroughly wax impregnated to protect internal details. Available either with soldering lugs or wire leads at same list price. Compact. Handy. Long service life.

Priced from 50c to 70c

### HI-VOLTAGE PAPER FILTER CONDENSERS



This line of paper dielectric filter condensers is intended for high-power amplifying systems, laboratory applications, special tube circuits, transmitter filter networks and similar purposes where high quality capacitors are required. Available in two designs: first, with insulated posts; second, with wire leads. The wire-lead design permits of a material reduction in price without sacrificing any other detail. Heavy metal container. Mounting feet. Standard capacities and working voltages are listed in accompanying table. It will be noted that where cost is a prime factor.

In Sizes of from 1 to 4 MFD.  
\$3.00 to \$44.00

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(THE NATIONAL TRADE MAGAZINE)

## Short Wave & Amateur Supplies, Parts, Sets, 15 to 200 Meters

**ACME SPECIALTY CO.,**  
2000 Mendel St., Chicago, Ill.  
"ACME" headphones for amateur and short wave use. Special light-weight models. 4000 ohms. \$1.50 per pair, for a sample, to recognized dealers, jobbers and amateurs. Catalog free.

**AEROVOX CORPORATION,**  
72 Washington St., Brooklyn, N. Y.  
AEROVOX condensers, all kinds, all sizes, for amateur and short wave and regular sets. Also complete line AEROVOX resistors, all sizes. Catalog free.

**ALDEN PRODUCTS CO.,**  
715 Center St., Brockton, Mass.  
Manufacturers of ALDEN sockets, adaptors, short wave plug-in wound coils. Code practice sets, 75c. Catalogs free.

**ALLIED RADIO CORPORATION,**  
437 West Jackson Blvd., Chicago, Ill.  
Jobbers of all known parts for any sets. Catalog free. Also special line of own make short wave sets.

**AMPERITE CORPORATION,**  
561 Broadway, New York, N. Y.  
VOLTAGE CONTROLS (TUBE). Automatically correct line voltage variations between 100 and 140 volts.

**AMY, ACEVES & KING,**  
11 West 42nd St., New York, N. Y.  
"AKAformer" kit for eliminating crashes, clicks and noises of man-made static in radio receivers. Complete catalog free.

**BANK'S INTER-AIR PRODUCTS,**  
Woodside, Long Island, New York.  
Coil Plugs. Special connectors. Battery Terminals and Specialties. Catalog free.

**BLAN, THE RADIO MAN,**  
177 Greenwich St., New York, N. Y.  
Aluminum Box Shields and sheet aluminum. Complete line amateur parts, all kinds, all makes. Special instruments to order. Catalog free.

**BLILEY PIEZO-ELECTRIC CO.,**  
Masonic Temple Bldg., Erie, Penn.  
Oscillating crystals. All frequencies.

**BRADLEY RADIO SERVICE,**  
288 Golden Gate Ave., San Francisco, Calif.  
Manufacturers of special ZEPP antenna spreaders, transposition blocks, insulators, panels of all kinds. Bakelite engraving. Bakelite nameplates. Transformers. Special receivers and transmitters. Machine work. Condensers. Special transmitting condenser dials, large size. Meters. Complete kits of parts. Custombuilt equipment to order.

**BURGESS BATTERY CO.,**  
Madison, Wisconsin.  
Burgess "striped" B and A Batteries for amateur and short wave sets. All sizes. Catalog on request.

**ALLEN D. CARDWELL MFG. CORP.,**  
83 Prospect St., Brooklyn, N. Y.  
CARDWELL condensers, variable, every size for amateur and s.w. work, also for special equipment. Precision laboratory condensers. Complete Catalog free.

**CENTRAL RADIO LABORATORIES,**  
Milwaukee, Wisconsin.  
CENTRALAB volume controls and resistors for amateur and short wave sets, as well as for any factory set. Replacement parts. Catalog on request.

**CHRISSELL ACOUSTIC LABORATORIES,**  
175 Sixty-eighth St., Brooklyn, N. Y.  
MICROPHONE KITS for amateur and special purposes.

**CLAROSTAT MFG. CO., INC.,**  
285 No. 6th St., Brooklyn, N. Y.  
Volume Controls, Resistors, Tone Controls, Voltage Regulators. Catalog free.

**COLLINS RADIO CO.,**  
Cedar Rapids, Iowa.  
"COLLINS" Transformers, all sizes. Chokes. Also special amateur equipment. Complete catalog free.

**CONTINENTAL CARBON, INC.,**  
13902 Lorraine Ave., Cleveland, Ohio.  
RESISTORS, all sizes. Replacement resistors, all sets. Catalog free.

**CORNELL ELECTRIC MFG. CO., INC.,**  
Long Island City, N. Y.  
Paper dielectric condensers, all sizes. Resistors. Filter and By-pass condensers. Interference filters. Catalog free.

**THE DATAPRINT COMPANY,**  
Lock Box 322, Ramsey, N. J.  
Data prints for making laboratory and special experimental devices, electromagnets, motors, transformers, inductances, electric clocks, telephones, medical coils, refrigerators.

**DELFT RADIO,**  
524 So. Fairbanks Ave., Oakland, Calif.  
Makers of the complete line of DELFT short wave and amateur receivers and transmitters, amplifiers, special equipment. Panels, racks, aerial equipment, etc. Catalog on request.

**DUBILIER CONDENSER CORP.,**  
4377 Bronx Blvd., New York, N. Y.  
Dry electrolytic condensers for all purposes, all sizes. Complete catalog on request.

**EASTERN COIL CO.,**  
56 Christopher Ave., Brooklyn, N. Y.  
Crystal holders for oscillating crystals. Special instruments and devices. Catalog free.

**ELECTRAD, INC.,**  
175 Varick St., New York, N. Y.  
Volume Controls, Grid Leaks, Resistors, Resistor Manuals, Amplifiers, Bypass Condensers. Catalog on Request.

**EMPIRE STATE RADIO LABS.,**  
Lyon Block, Albany, N. Y.  
"EMP-LAB" short wave receivers and transmitters for amateur and special purposes. Catalog free.

**F & H RADIO LABORATORIES,**  
Fargo, North Dakota.  
Makers of aerial eliminators. Catalog free.

**FEDERATED PURCHASER,**  
25 Park Place, New York, N. Y.  
Jobbers of all nationally known and special amateur and short wave parts and equipment of every description. Catalog free.

**M. M. FLERON & SON, INC.,**  
Trenton, New Jersey.  
Amateur and short wave aerial accessories, insulators, eliminators, lightning arrestors, tone controls, stand-off insulators, masts, etc. Shielded lead-in wire. Aerial wire, all sizes. Wholesalers and manufacturers.

**GATES RADIO & SUPPLY CO.,**  
Quincy, Illinois.  
MICROPHONES and amplifier equipment, amateur and professional use. Catalog free.

**GAVITT MFG. CO.,**  
Brookfield, Mass.  
"GAVITT STAR" Microphones, all types. Catalog free.

**GENERAL DRY BATTERIES, INC.,**  
13000 Athens Ave., Cleveland, Ohio.  
GENERAL batteries, A and B, for amateur sets and short wave equipment.

**GENERAL RADIO CO.,**  
30 State St., Cambridge, Mass.  
"G.R." precision instruments, oscillators, special equipment. Laboratory equipment. Oscillating crystals. Precision amateur condensers, etc. Catalog on request.

**GIRARD HOPKINS CO.,**  
1437 Twenty-third Ave., Oakland, Calif.  
Makers of "G-H" Transmitting Condensers for amateur and all other sets. Filter chokes, Resistors, all sizes. Complete line replacement parts.

**GROSS RADIO,**  
25 Warren St., New York, N. Y.  
"THE HAWK" complete short wave 3 tube receiver, \$22.00, net price. Aluminum Shield cans and Aluminum panels. Also short wave transmitting and receiving parts and sets.

**HAMMARLUND MFG. CO.,**  
424 W. 33rd St., New York, N. Y.  
"THE COMER PRO". A professional completely built custom short wave receiver of world-wide range. Also makers of many parts for short wave sets. Catalog on request.

**HARRISON RADIO CO.,**  
189 Franklin St., New York, N. Y.  
Complete line of standard factory short wave sets, parts and equipment. Also the "ROYAL" Complete short wave receiver, \$14.70, up. Bulletins on request.

**CHAS. HOODWIN CO.,**  
4240 Lincoln Ave., Chicago, Ill.  
"AERO" short wave receivers and transmitters. Parts and Supplies. Complete Catalog free.

**INSTRUCTO-GRAPH CO.,**  
912 Lakeside Place, Chicago, Ill.  
Code practice equipment. Automatically teaches the code. Catalog free.

**INSULINE CORP. OF AMERICA,**  
23 Park Place, New York, N. Y.  
Complete line short wave receiving and transmitting equipment, parts and accessories. Sockets, special 50 watt and other type. High insulation sockets, etc. Special devices. Complete catalogs free.

**INTERNATIONAL RESISTANCE CO.,**  
2601 Chestnut St., Philadelphia, Pa.  
METALLIZED RESISTORS (I.R.C.) in all sizes for amateur sets and shortwave sets. Also for replacement purposes and special resistor kits for service men.

**CHAS. F. JACOBS,**  
270 Lafayette St., New York, N. Y.  
Antenna feed line separators. Other antenna equipment. Circular on request.

**JANETTE MFG. CO.,**  
555 W. Monroe St., Chicago, Ill.  
JANETTE rotary converters. Motor generators for amateur and all special purposes. Motors, etc.

**JEWELL RADIO CO.,**  
110 Chambers St., New York, N. Y.  
"PURADYNE" PRODUCTS: power transformers, filament transformers, chokes, filter condensers, microphones. 50 watt sockets. Power supply units.

**E. F. JOHNSON CO.,**  
Waseca, Minnesota.  
50 watt sockets. Stand-off Insulators. Catalog free.

**KESTER SOLDER CO.,**  
Chicago, Ill.  
Special radio solder, rosin core, "KESTER". Circulars free.

**LEEDS,**  
45 Vesey St., New York, N. Y.  
Complete line short wave receivers, amateur parts, supplies, equipment. Catalog free.

**LINCOLN RADIO CORPORATION,**  
329 South Wood St., Chicago, Ill.  
LINCOLN "DE LUXE" short wave receivers, complete with power units. Amateur and other wavebands. Also chassis.

**LITTLEFUSE LABORATORIES,**  
1772 Wilson Ave., Chicago, Ill.  
"Littlefuses" for amateur sets. Various sizes. Catalog on request.

**LYNCH MANUFACTURING CO.,**  
1775 Broadway, New York, N. Y.  
Complete line of special antenna equipment. Lynch resistors, all sizes. Noise reducing antenna products. Aerial spreaders. Antenna insulators and couplers. Catalog free.

**M & H SPORTING GOODS CO.,**  
512 Market St., Philadelphia, Penn.  
SHORT WAVE KITS, parts, accessories, every description. Catalog on request.

**P. R. MALLORY & CO., INC.,**  
Indianapolis, Indiana.  
"ELKON" B Battery Eliminators. "ELKON" complete line dry electrolytic condensers, all sizes. Also "YAXLEY" controls, all kinds. Catalogs on request.

**MANHATTAN ELECTRIC BARGAIN HOUSE,**  
105 Fulton St., New York, N. Y.  
Jobbers of all known amateur and short wave receiving and transmitting equipment. Catalog free.

**MILES REPRODUCER CO.,**  
26 East 22nd St., New York, N. Y.  
Microphones. Large horns. Special sound equipment.

# Sylvania Tubes

(Reg. U. S. Pat. Off.)

Make . . .  
Every set  
do its best

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## Short Wave & Amateur Supplies, Parts, Sets, 15 to 200 M—(Cont'd)

**J. W. MILLER CO.,**  
517 So. Main St., Los Angeles, Calif.  
R.F. Inductance coils, chokes, etc. Catalog free.

**THE NATIONAL CO., INC.,**  
61 Sherman St., Malden, Mass.  
Makers of a complete line of "NATIONAL" short wave transmitting equipment, including many types of complete short wave receivers and precision parts. Also booklets on short wave sets. Vernier Dials. Power packs. Amplifiers.

**OHIO CARBON CO.,**  
12502 Berea Road, Cleveland, Ohio.  
Manufacturers of OHIOHM RESISTORS of every size and style. Spark suppressor sets for auto radios. Special resistors. Catalog on request.

**PREMIER CRYSTAL LABS., INC.,**  
72 Cortlandt St., New York, N. Y.  
Oscillating crystals. Catalog free.

**RADIO ELECTRIC SERVICE CO.,**  
Seventh and Arch Sts., Philadelphia, Penn.  
Makers of 3 tube short wave converter kit for amateur and all other short wave use. \$7.50. Catalog free.

**RADIO ENGINEERING LABS., INC.,**  
100 Wilbur Ave., Long Island City, N. Y.  
Makers of the "R.E.L." complete line every conceivable short wave and amateur receiving and transmitting apparatus. Also special equipment. Catalog free.

**RADIO RECEPTOR CO.,**  
108 Seventh Ave., New York, N. Y.  
Microphones for amateur radiophones and for professional purposes. Catalog free.

**REMLER CO., LTD.,**  
2101 Bryant St., San Francisco, Calif.  
REMLER condenser microphones. Also complete line REMLER short wave receivers. Catalog free.

**MAURICE SCHWARTZ & SON,**  
710 Broadway, Schenectady, N. Y.  
Knock-Down aluminum cans and sheet aluminum panels.

**SCIENTIFIC RADIO SERVICE,**  
124 Jackson Ave., University Park, Hyattsville, Md.  
"QST" Oscillating crystals for s.w. transmitters. Free catalog.

**E. H. SCOTT RADIO LABORATORIES,**  
4450 Ravenswood Ave., Chicago, Ill.  
Makers of "SCOTT ALL-WAVE" RECEIVERS. Complete sets. Custom Made. World-Wide Range. Catalog on Request.

**SHALLCROSS MFG. CO.,**  
700 Parker Ave., Collingdale, Penn.  
RESISTORS. All sizes, for any purpose. Catalog on request. Special resistor kits.

**SHURE BROS. CO.,**  
337 West Madison St., Chicago, Ill.  
MICROPHONES for amateur and commercial sets. Catalog free.

**SOUND ENGINEERING CORP.,**  
Woolworth Bldg., New York, N. Y.  
Condenser Microphones. Catalog free.

**TELEPLEX COMPANY,**  
76 Cortlandt St., New York, N. Y.  
CODE PRACTICE APPARATUS "TELEPLEX". Automatically teaches the code. Catalog free.

**THORDARSON ELECTRIC MFG. CO.,**  
500 W. Huron St., Chicago, Ill.  
Audio and power transformers, all sizes. Chokes. Power packs. Complete catalogs on request.

**TOBE DEUTSCHMANN CORP.,**  
Canton, Mass.  
TOBE condensers for amateur sets and for all standard factory sets. Replacement condensers. Interference elimination devices. FILTERETTES. Catalogs on request.

**TRIMM RADIO MFG. CO.,**  
1528 Armitage Ave., Chicago, Ill.  
"Featherweight" Trimm headphones. Lightest weight headphones made. High resistance. Catalog free.

**TRYMO RADIO CO.,**  
177 Greenwich St., New York City, N. Y.  
Standard stock of short wave parts and equipment for every purpose. Circulars free.

**UNCLE DAVE'S RADIO SHACK,**  
356 Broadway, Albany, N. Y.  
Jobbers of all makes of amateur and short wave parts and equipment of every description. Catalogs free.

**UNITED RADIO BUILDERS,**  
1234 Springfield Ave., Irvington, N. J.  
Makers of custom built amateur and special short wave sets, transmitting and receiving. Parts of every known make and special supplies. Catalog free.

**UNITED RADIO MFG. CO.,**  
191 Greenwich St., New York, N. Y.  
Aluminum, all kinds. Formica. Hard rubber. Brass couplings and bushings. Machine work for amateur and short wave sets. Special insulation material.

**UNIVERSAL MICROPHONE CO.,**  
424 Warren Lane, Inglewood, Calif.  
Amateur and professional microphones of every type and description, in all price ranges. Also special microphone transformers and all allied equipment. Catalogs free.

**UNIVERSAL WIRELESS SALES CO.,**  
412 No. Leavitt St., Chicago, Ill.  
Jobbers of all known makes of amateur and s.w. equipment. Catalog free.

**VIBROPLEX CO.,**  
825 Broadway, New York, N. Y.  
Automatic keys, "MARTIN VIBROPLEX". For high speed hand sending.

**DON C. WALLACE,**  
4214 Country Club Drive, Long Beach, Calif.  
SHORT WAVE LOG with patented time-dial giving world-time schedules, all short wave stations. Most practical short wave call book and dial-log yet published. Sample copy for 50c postpaid.

**WARD LEONARD MFG. CO.,**  
Mt. Vernon, N. Y.  
Resistances. Controls. Special devices. Catalogs on request.

**WESTERN WIRELESS, LTD.,**  
95 Minna St., San Francisco, Cal.  
Crystal ovens, duplex. For oscillating crystals.

**WESTON ELECTRICAL INSTRUMENT CORP.,**  
581 Frelinghuysen Ave., Newark, N. J.  
Weston and Jewell Meters for all purposes. Any size. Any style. Complete catalog for the trade.

**WHOLESALE RADIO SERVICE CO.,**  
100 Sixth Ave., New York, N. Y.  
LAFAYETTE All-Wave set for amateur and all short wave purposes. Also jobbers for all factory made amateur and short wave parts and supplies of every known description. Catalog free.

**THE WIRELESS SHOP,**  
150 Glendale Blvd., Los Angeles, Calif.  
Special amateur transmitting condensers, variable. Precision types. Special condensers, all purposes. Catalog free.

## TRANSFORMERS REWOUND

Any Make . . . Any Size. Exact Duplicate of Factory Specifications.  
8 HOUR SERVICE.

We pay shipping charges one way.  
Prompt mail order service . . . Anywhere. Write for price list.

## TRANSFORMER SERVICE COMPANY

1247 - 47th Ave., Tel. MONTrose 2190  
SAN FRANCISCO, CALIF.

## COMING SOON! The 1933 Short-Wave Manual

—By DON C. WALLACE—  
Winner of the President  
Hoover Cup for Best  
Short Wave Reception.

## JOBBERS DEALERS AND REPRESENTATIVES WANTED

**H**ERE is NEWS! A short wave manual written by the man who is the acknowledged authority on the subject . . . the man who was awarded the Hoover Cup. His short wave Manual will be ready in 60 days. It will be 1933's best seller. Written so that anybody can understand it. Tells how to build an exact duplicate of the set used in winning the Hoover Cup. Tells how to build short wave aeriels that make ANY set work better. Tells how to build various types of WALLACE short wave sets that have no parallel. Explains how short waves work. Gives complete short wave schedules and time charts. Tells how to build the Wallace short wave transmitter. Shows how to make BEGINNER'S SETS. Nothing else like it ever published. It's ORIGINAL . . . because Wallace tells, for the first time, how to build sets just like his own. Ready for distribution early in March . . . perhaps sooner. Pre-publication orders now accepted. Price, \$1.00 per copy, list. Jobbers, dealers, representatives and sales agents wanted NOW. Write for full details.

Published by  
The Publishers of "RADIO"  
Pacific Bldg., San Francisco, Calif.

# Sylvania tubes

"Tested for a . . .  
set like yours"

# THE RADIO BUYERS' GUIDE OF "RADIO" (THE NATIONAL TRADE MAGAZINE)

JANUARY, 1933

Who Makes It . . . Where to Buy It . . . What It Costs

## TRIAD RADIO TUBES

### MANUFACTURED BY

Triad Mfg. Co., Inc.,  
Pawtucket, R. I.

### OFFICERS OF THE COMPANY

George Coby—President  
Harry H. Steinle—Vice-President  
Ely Egnatoff, Treasurer  
Wm. Cepek—Secretary

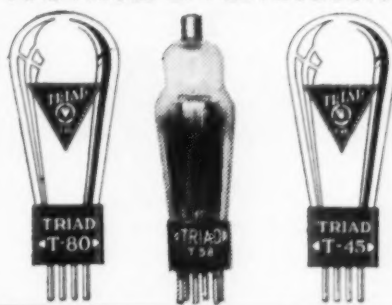
### BRANCH OFFICES AND AGENCIES

E. C. Blakeman, 929 Myrtle St., N.E.,  
Atlanta, Georgia.  
C. J. Curry, 5242 College St.,  
Indianapolis, Indiana.  
Eastern Trade Ass'n, 602 Beacon St.,  
Boston, Massachusetts.  
C. I. Finn, 417 - 11th St., N.W.,  
Washington, D. C.  
Gardner Co., 3711 Washington Ave.,  
St. Louis, Missouri.  
P. C. Gaines, 1212 N. 52nd St.,  
Omaha, Nebraska.  
T. E. Jacobson, 822 Crest Ave.,  
Tampa, Florida.  
Frank H. Kaiser, 510 Prudential Bldg.,  
Buffalo, New York.  
Richard King, 139 N. Front St.,  
Philadelphia, Penn.  
David Klein, 2 West 18th St.,  
New York, New York.  
Eric G. Matchette, 4144 Forest Ave.,  
Cincinnati, Ohio.  
Power Jones Co., 1900 Euclid Ave.,  
Cleveland, Ohio.  
A. R. Middleman, 205 Investment Bldg.,  
Pittsburgh, Penn.  
M. G. Myers Co., 1115 Hall St.,  
Dallas, Texas.  
H. M. Nisbet, 53 Fourth St.,  
Portland, Oregon.  
Norton Sales Co., 285 Brannan St.,  
San Francisco, California.  
Gustav Oden, 18 Woodman St.,  
Providence, Rhode Island.  
Thomas S. Orr, 1736 Washington St.,  
Denver, Colorado.  
Frederic F. Palmer, 490 Sexton Bldg.,  
Minneapolis, Minnesota.  
William Payton, 487 Friendship St.,  
Providence, Rhode Island.  
E. H. Pratt, 106 E. 14th St.,  
Kansas City, Missouri.  
Edward Singer, 3103 S. Michigan Ave.,  
Chicago, Illinois.  
L. Slowinski, 5914 Chene St.,  
Detroit, Michigan.  
Walter S. Sweet, 1426 Maple St.,  
Los Angeles, California.  
Royal Nat'l Co. (Export) 47-02 5th Ave.,  
Long Island City, New York.

### WHERE WAREHOUSE STOCKS ARE CARRIED

Pawtucket, Rhode Island.  
Chicago, Illinois.  
Los Angeles, California.  
San Francisco, California.  
Portland, Oregon.  
Kansas City, Missouri.  
Minneapolis, Minnesota.

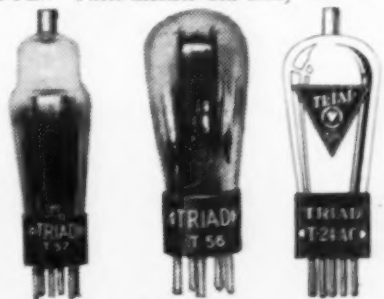
### THE COMPLETE TRIAD LINE AND PRICES OF ALL PRODUCTS



### PRICE LIST ON STANDARD TYPES RADIO TUBES

Type	List Price
T-01A	Gen'l Purpose Detect. & Amp. \$ .80
T-10	Power Amplifier 7.25
T-10S	High Voltage Power Amplifier 8.00
T-12A	D.C. Power Amplifier 1.55
T-22	D.C. Screen Grid Amplifier 3.15
T-24A	A.C. Screen Grid Amplifier 1.65
T-26	A.C. General Purpose Amplifier .85
T-27	Detect. or Amp. having A.C. Heat. 1.05
T-30	D.C. General Purpose Amplifier 1.65
T-31	D.C. Power Amplifier 1.65
T-32	D.C. Screen Grid Amplifier 2.35
T-33	D.C. Pentode Power Amplifier 2.80
T-34	D.C. Multi-Mu R.F. Amplifier 2.80
T-35	A.C. Heater Type Multi-Mu R.F. Amplifier 1.65
T-36	D.C. Ser. Grid Amp. : Heat. Type 2.80
T-37	D.C. General Purpose Amplifier 1.80
T-38	D.C. Pent. Pwr. Amp., Heat. Type 2.80
T-39	D.C. Heater Type Multi-Mu R.F. Amplifier 2.80
T-40	D.C. Voltage Amplifier 3.00
T-41	Power Amplifier Pentode 2.85
T-45	A.C. Triode Power Amplifier 1.15
T-46	A.C. Power Amplifier 1.55
T-47	A.C. Pentode Power Amplifier 3.75
T-48	Pwr. Amp. Tetr., 20 v. DC Heat. 3.75
T-50	A.C. Power Amplifier 6.20
T-51	A.C. Heater Type Multi-Mu R.F. Amplifier 1.65
T-55	A.C. Duplex Diode Triode 1.60
T-56	General Purpose Amplifier 1.30
T-57	A.C. Pentode R.F. Amplifier 1.65
T-58	A.C. Pent. Multi-Mu R.F. Amp. 1.65
T-59	Heater Type Power Amplifier, Triple Purpose 2.50
T-86A	D.C. General Purpose Amplifier 2.10
T-71A	A.C. or D.C. Power Amplifier .95
T-85	D.C. Duplex Diode Triode 1.60
T-89	Triple Grid Power Amplifier 1.80
T-99X	Dry Batt. Gen'l Purpose Amplifier 2.55
T-99V	Dry Batt. Gen'l Purpose Amplifier 2.75
T-841	Power Amplifier 10.40
T-842	Heavy Duty Power Amplifier or Modulator 10.40
T-66	Half Wave Mercury Rectifier 6.75
T-80	Full Wave Rectifier 1.05
T-81	Half Wave Rectifier 5.20
T-82	Full Wave Mercury Vapor Rect. 1.30
T-83	Heavy Duty Full Wave Merc. Rec. 1.55
T-TEL	Television Scanning
T-CNA	Television Projection
T-PEC	Photo-Electric Cell

Price on Application



Licensed

### TRIAD HISTORY, POLICIES, GUARANTEE, ADVERTISING, & SALES HELPS AVAILABLE

The Triad Mfg. Co. recognizes its most important intangible asset is "Good Will" and offers the utmost co-operation to its customers at all times.

The officers of the company have been manufacturing tubes since the industry first started and continually strive to produce tubes which are "better". They own their own plant capable of producing 40,000 tubes per day, and manufacture not only all types listed but practically all the component parts of each type. Their constantly increasing business with the small number of returns (less than 2 per cent for the past two years) is the best evidence of customer satisfaction.

Every Triad tube is manufactured to the latest approved specifications and test limits and is guaranteed for a period of three months from date of sale to the customer. A label is placed on each tube with space for inserting dealer's name and date of sale and the color of these labels is changed every three months. This protects the dealer and jobber.

An additional three months period is allowed for selling to the customer or release from the dealer's shelves making a total of 6 months for guarantee and turnover.

Triad has done extensive advertising and is now running copy in a number of trade periodicals in addition to newspaper advertising in certain centers. Triad has at all times co-operated with local distributors on any advertising campaigns in which they participate and will gladly furnish newspaper mats, copy or other material upon request. Considerable publicity has been released and still continues at stated intervals.

Triad is glad to furnish gratis to their customers price lists, catalogue sheets, complete engineering data sheets, counter cards and attractive window displays, and will co-operate at all times to further the sale of its product.

**TRIAD MANUFACTURING COMPANY, INC.**  
Pawtucket, R. I.

# THE RADIO BUYERS' GUIDE

OF  
"RADIO"

THE NATIONAL TRADE MAGAZINE

JANUARY, 1933

Who Makes It . . . Where to Buy It . . . What It Costs

## STEWART-WARNER

### STEWART-WARNER CORPORATION

Factory and Sales Headquarters:  
1826 Diversey Parkway, Chicago, Ill.

Stewart-Warner Radios are sold only  
through these authorized distributors:

Baltimore Gas Light Co.  
111 E. Lombard St., Baltimore, Md.

Marshall-Wells Company  
Billings, Montana

Bluefield Hardware Co.  
400 Bluefield Ave., Bluefield, W. Va.

Stewart-Warner Sales Co.  
1111 Commonwealth Ave., Boston, Mass.

Stewart-Warner Sales Co.  
25 Barker St., Buffalo, N. Y.

Stewart-Warner Sales Corp.  
125 W. 4th St., Charlotte, N. C.

Stewart-Warner Corporation  
2436 S. Michigan Ave., Chicago, Ill.

Auto-Rad Supply Company  
Court and Sycamore Sts., Cincinnati, O.

Arnold Wholesale Corp.  
5209 Detroit Ave., Cleveland, O.

Tracy-Wells Company  
175 N. Front St., Columbus, O.

Porter Burgess Co.  
Jackson and Preston Sts., Dallas, Tex.

Stewart-Warner Sales Co.  
1344 Broadway, Denver, Colo.

Iowa Radio Corporation  
1212 Grand Ave., Des Moines, Iowa

Electrical Specialties Co.  
433 E. Larned St., Detroit, Mich.

Marshall-Wells Co.  
Duluth, Minn.

Alemite Co. of El Paso  
P. O. Box 996, El Paso, Texas

National Mill Supply Co.  
207 E. Columbia St., Fort Wayne, Ind.

Stewart-Warner Sales Co.  
42-44 N. Cameron St., Harrisburg, Pa.

Stewart-Warner Sales Co.  
45 Wells St., Hartford, Conn.

Indiana Paper Co.  
121 S. Pennsylvania St., Indianapolis, Ind.

Parsons Electric Co.  
2010 Grand Ave., Kansas City, Mo.

Korsmeyer Company  
412 S. 9th St., Lincoln, Nebr.



### All-Wave 11-Tube Superheterodyne Line

Model	
55—Magic Dial Console .....	\$119.75
56—(illustrated below)	
Magic Dial Console .....	129.75
50—Master All-Wave Console .....	157.50
51—De Luxe All-Wave Console.....	194.50
58—Radio-Phonograph .....	270.50



### 7-Tube Superheterodyne Line

Model	
63—Console .....	\$68.95
64—Console .....	74.95
65—(illustrated above) Console .....	83.95
68—Radio-Phonograph .....	154.00
49—Battery Console .....	\$75.95

Prices slightly higher West of the Rockies.  
25-cycle A.C. and D.C. prices slightly higher.

Incandescent Supply Co.  
1000 S. Los Angeles St., Los Angeles, Cal.

Belknap Hardware & Mfg. Co.  
111 E. Main St., Louisville, Ky.

McGregor's Incorporated  
Union & Marshall Aves., Memphis, Tenn.

Standard Distributing Corp.  
426 E. Wells St., Milwaukee, Wis.

Marshall-Wells Company  
Minneapolis, Minn.

Reliable Tire & Accessories Co.  
Muskegon, Mich.

Eastern Electrical Supply Co.  
287 Halsey St., Newark, N. J.

C. T. Patterson Co., Inc.  
800 S. Peters St., New Orleans, La.

Commonwealth Radio Dist. Corp.  
13-15 Laight St., New York, N. Y.

Dix Bowers Company  
Olney Road & Boush St., Norfolk, Va.

Oklahoma City Hardware Co.  
25 E. California St., Oklahoma City, Okla.

Stewart-Warner Corporation  
1419 N. Broad St., Philadelphia, Pa.

Logan Gregg Hardware Co.  
121 Ninth St., Pittsburgh, Pa.

Marshall-Wells Company  
Portland, Ore.

Bright & Company  
8th and Elm Sts., Reading, Pa.

A. R. Tiller, Inc.  
1800 W. Broad St., Richmond, Va.

Junction Drug Co.  
312 Illinois Ave., St. Joseph, Mo.

Stewart-Warner Sales Co.  
3227-29 Locust Blvd., St. Louis, Mo.

R. L. Ross Co.  
118 - 7th St., San Antonio, Tex.

Incandescent Supply Co.  
726 Mission St., San Francisco, Cal.

Pond & Heimbach  
403 Linden St., Scranton, Pa.

Marshall-Wells Co.  
Spokane, Wash.

Stollberg Hwde. & Paint Co.  
724 Monroe St., Toledo, Ohio

A. W. Schuller, Inc.  
114 E. 9th St., Tulsa, Okla.

Stewart-Warner Products Co.  
415 East 2nd St., Wichita, Kans.

# ~~CROSLEY~~ Announces..

A complete line of radio receiving sets in a popular price range below \$50.00. The most outstanding radio values ever presented.

---

**10 Tube TENACE \$39.99**  
Same Lowboy Console \$49.99  
Superheterodyne, Automatic Volume Control,  
Tone Control, Latest Tubes, Newest Features. Complete Tax Paid

---

**7 Tube SEPTET \$29.99**  
Same Lowboy Console \$39.99  
Superheterodyne, Automatic Volume Control,  
Tone Control, Newest Tubes, Latest Features. Complete Tax Paid

---

**5 Tube FIVER \$19.99**  
Same Lowboy Console \$29.99  
Superheterodyne, Newest Tubes, Latest Features. "A Five in the price range of the Fours." Complete Tax Paid

---

These newest 1933 model Crosley radio sets offer such startling values that no one need consider cut price, over-stock, liquidation, obsolete, sales promotion, or orphan radio sets heretofore offered in this price range.

*Montana, Wyoming, Colorado, New Mexico and west, prices slightly higher.*

**THE CROSLEY RADIO CORPORATION**

Powel Crosley, Jr., President

CINCINNATI

Home of "the Nation's Station"—WLW

YOU'RE THERE WITH A CROSLEY  
**~~CROSLEY~~ RADIO**

# MAGNAVOX SPEAKERS and CAPACITORS

MODEL  
150



6" Dynamic Speaker

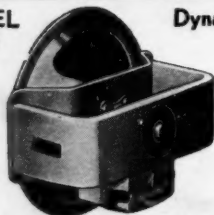
MODEL  
152-X



10" Dynamic Speaker

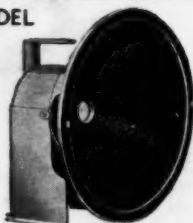
MODEL  
254

Dynamic



8" Permanent Magnet Speaker

MODEL  
517



14" Dynamic For Public Address

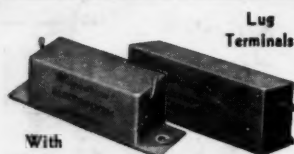


Mershon  
Capacitors

Right  
Clamp Type

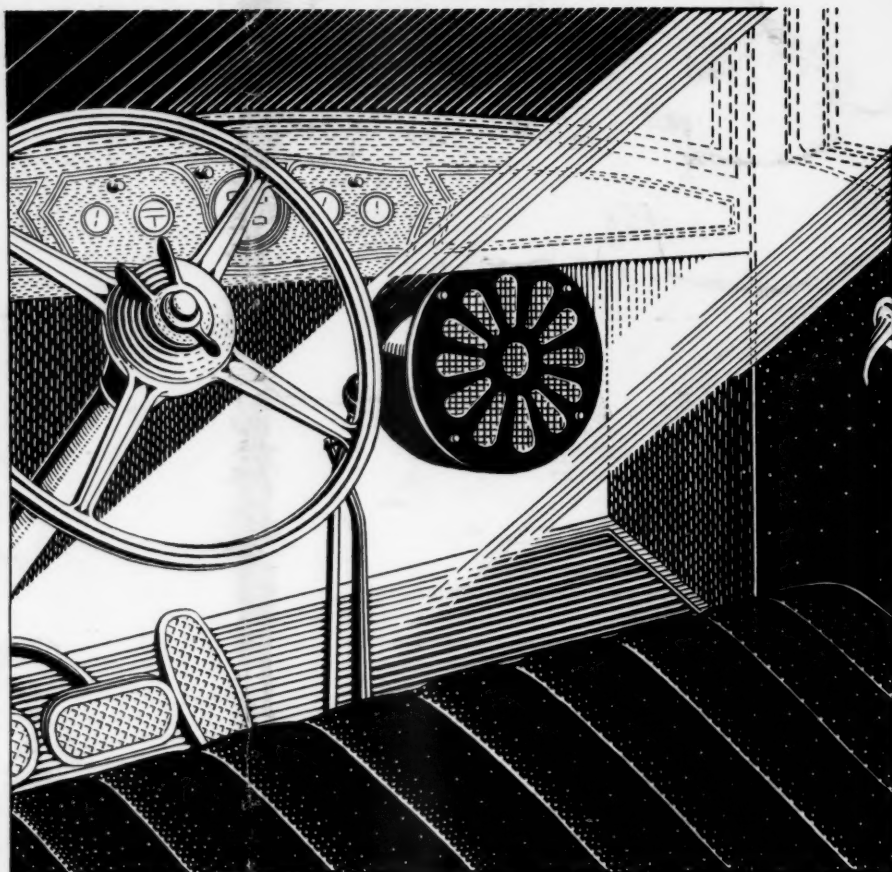


Left  
Stud Type  
Mounting



With  
Flange

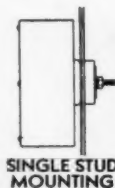
MAGNAVOX Capacitors



## ● MAGNAVOX AUTO SPEAKERS

● MAGNAVOX-QUALITY will help you secure trouble-free performance and long life under the difficult conditions which automobile radios must face. MAGNAVOX Engineering has mastered the tone problem --- the most difficult in auto radio --- and has added new features, assuring ease and simplicity of installation. That is why Magnavox Speakers are specified by a number of large manufacturers of radio sets for automobile use.

Rugged dust-proof design makes Magnavox Speakers a match for the punishment they are sure to receive in automobile use. The Single Stud Mounting makes installation on any dash easy.



SINGLE STUD  
MOUNTING

Also remember Magnavox Permanent Magnet Speakers, ---ideal for automobile use, because there is no drain on the battery. Especially desirable for police cars that cruise long without battery attention.

Write for more information on any Magnavox product which interests you. Submit your specifications and ask for samples.

## Magnavox Company Ltd.

ESTABLISHED 1911

GENERAL OFFICES AND FACTORY, FORT WAYNE, INDIANA

Subsidiaries

THE MAGNAVOX COMPANY, ELECTRO FORMATION, INC.,  
MAGNAVOX (AUSTRALIA), LTD., MAGNAVOX (GREAT BRITAIN), LTD.